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TM 10-390

WAR DEPARTMENT

U.S. Dept. of Army

TECHNICAL MANUAL

OPERATION OF THE REMOUNT BREEDING SERVICE

February 28, 1941

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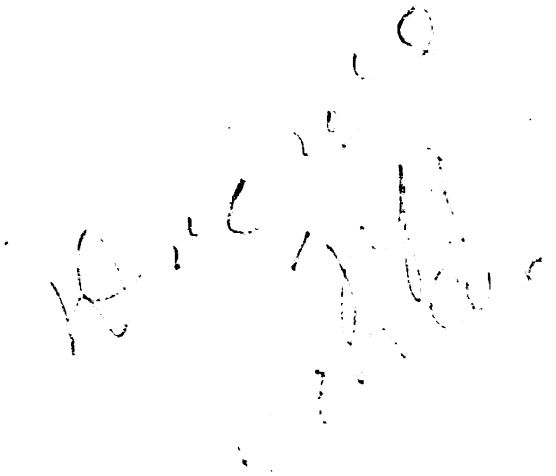

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TECHNICAL MANUAL

OPERATION OF THE REMOUNT BREEDING SERVICE

CHANGES No. 1

WAR DEPARTMENT
WASHINGTON 25, D. C., 7 March 1946

TM 10–390, 28 February 1941, is changed as follows:

1. The Army horse * * * operation in 1920. At present 500 stallions are standing in charge of civilian agents throughout the United States, under general supervision of remount officers. Much valuable information * * * proved beyond question.

19.1 Artificial Insemination (Added).

a. Artificial insemination is the introduction of male seminal fluid (semen), containing spermatozoa, into the female genital tract (uterus or vagina) by artificial methods. Two operations are involved in this process, namely: collection of semen, and insemination of the mare with some of this fluid. Various methods have been evolved and used for collecting semen, but the ones most favored now are: the artificial vagina, the breeder's bag, and the semen aspirator. Each of these has its advantages and disadvantages, so it is well to study all aspects of the different collection procedures before selecting the one to be used.

b. Several types of artificial vaginas have been invented within recent years. Generally, however, such apparatus consists essentially of a rather thin, inner, rubber tube surrounded by an airtight and watertight jacket, made by attaching a heavy, outer cylinder of rubber, glass, ebonite, or metal to the inner one. One end of the inner tube has an opening large enough to permit the entrance of the stallion's penis, while the other is tapered so it will fit tightly over the mouth of the glass container used for collecting the semen. Valves are provided in the outer jacket to allow entrance and discharge of the air or water which is used to warm and inflate the instrument before use.

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c. The breeder's bag is an elongated rubber sack which is lubricated on the outside surface and then slipped over and fastened on the penis of the stallion just before mating. Such bags may be obtained in different sizes, those for draft stallions being the largest; when properly adjusted and used, they should capture the entire ejaculate. Collection of semen by aspiration involves the use of a suction type device such as that shown in figure 16.2. With this the seminal fluid generally is withdrawn from the bottom of the vagina.

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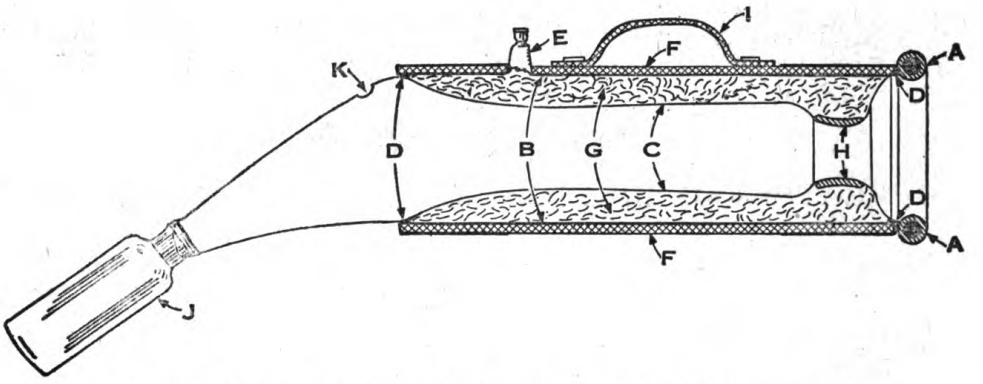

a. Entrance ring made by enclosing section of ½-inch garden hose.
b. Outer tube.
c. Inner tube.
d. Points at which the outer tube is vulcanized to the inner tube.
e. Air valve.
f. Leather casing to give support and rigidity.
g. Air space between inner and outer tube which allows for the adjustment of pressure.
h. "Sphincter" rubber band, made of 3-inch flat-diameter tubing 1½ to 2 inches broad.
i. Handle grip attached to leather casing.
j. 8-ounce collecting bottle.
k. Air vent to prevent ballooning.

***Figure 16.1.** Longitudinal section of the Missouri U. S. D. A. model artificial vagina for the horse. Length 18 inches, 7-inch rubber tubing, flat diameter.*

d. In the practice of artificial insemination, it is highly desirable that the work be conducted or supervised by a veterinarian. A primary consideration is that the operators be trained thoroughly in at least one of the approved methods of semen collection. Also, they should be familiar with the location and function of the mare's genital organs and with stallion and mare management during work. Moreover, the proper apparatus must be on hand, rigid standards of cleanliness must be adhered to, and the entire process should be carried out in a careful, quiet, systematic, efficient fashion.

e. During collections for insemination purposes, the sire is handled in much the same way as for normal service. Usually at this time it is advisable to clean the penis of dirt, scales, and other foreign material. This can be accomplished by washing that organ with warm water and a mild soap, followed by a thorough rinse with clean, warm water. Also, some moderate exercise in the form of walking may be helpful in obtaining prompt service.

f. There should be evidence that the mare is in heat, and she should be restrained with breeding hobbles. Use of the twitch will not be required unless the mare is unruly and nervous, but her tail should be bandaged and tied, and the entire area around the vulva washed

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well with soap and warm water. The washing should be followed by a thorough rinsing with clean, warm water. If it is necessary to douche or flush out the mare's vagina before breeding, a solution made of 1 quart of boiled water (cooled to body temperature), 1 tablespoonful of baking soda, and 2½ tablespoonfuls of salt may be used. Do not breed or inseminate a mare thus treated, however, until 2 or more hours have elapsed.

g. Semen collections made with live mares and the artificial vagina require at least three operators. One to hold the mare, and another to manage the stallion. The third should handle the instrument. In this procedure the stallion is led up to the mare quietly and slowly and is permitted to mount naturally. As this is accomplished, the operator holding the collection device grasps the penis and directs it sidewise through the front opening and into the lubricated inner chamber of the instrument. The artificial vagina must be maintained in position during service until ejaculation is completed and the stallion dismounts. It is then removed and the bottle containing the semen is detached and either tightly stoppered or its contents emptied into the gelatin capsules to be used for insemination.

h. Collections made with the breeder's bag and semen aspirator

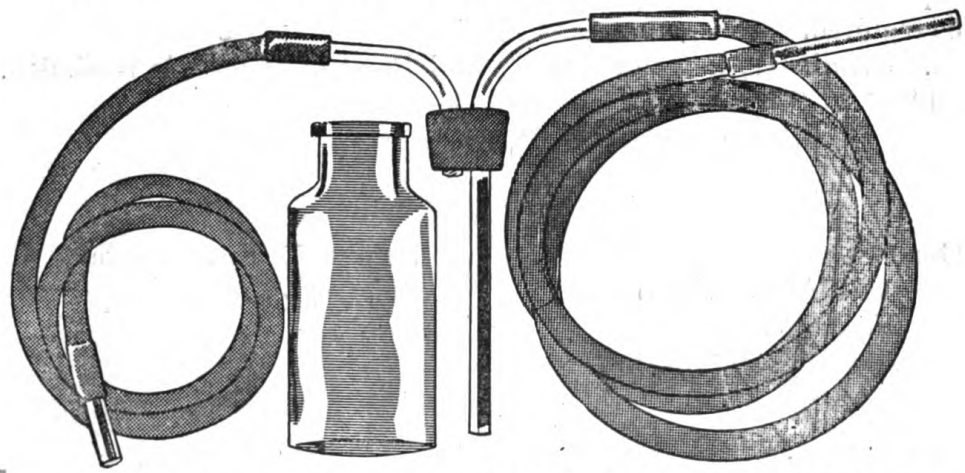

Figure 16.2. Semen aspirator. A 6-ounce bottle, two-hole rubber stopper, heavy walled 3/16-inch gum-rubber tubing, and four glass tubes are required for this equipment.

involve normal breeding service procedures with the exception that the ejaculate in the former method is caught in the rubber container, which is removed and emptied as soon as the stallion dismounts. Normally, two or three operators are required to obtain collections in either of these ways.

i. The mare or mares to be inseminated must be fully in heat and preferably at that stage of estrus just prior to ovulation. As a precaution against kicking, it is well to apply hobbles, and the use of tail

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bandages is customary. The quarters used for the work should be clean, dry, dust free, and fairly well lighted. Just prior to insemination the mare's vulva should be wiped and dried and its inner lips swabbed with clean pieces of cotton. Also, the mare should be held so that her hindquarters are facing the light.

j. A simple, efficient, and convenient method of insemination is to use a gelatin capsule which will hold from ½ to 1 ounce (15 to 30 cc.) of semen. After being filled and capped, this container is carried into the vagina by hand and is placed well forward in the cervix, with the fingers. For this operation the hand and arm of the operator must be clean and well-lubricated, with the fingernails short and smooth. Some operators prefer to use a rubber glove and obstetrical sleeve during capsuling, because this reduces the chances of causing or spreading infection. Such equipment must be disinfected, washed, and rinsed thoroughly after each insemination, and it should be lubricated on the outside surfaces just before use.

k. After insemination is completed the hobbles and tail bandage are removed and the mare should be placed in a box stall where she may be watched for an hour. Particular attention should be paid at this time to see there is no straining or wrenching with consequent expulsion of the semen, for if this occurs, another insemination may be required.

Appendix II, Remount Depots and Remount Areas, is rescinded.
[AG 300.7 (7 Feb. 46)]

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TECHNICAL MANUAL
No. 10-390

WAR DEPARTMENT,
WASHINGTON, *February 28, 1941.*

OPERATION OF THE REMOUNT BREEDING SERVICE

Prepared under direction of
The Quartermaster General

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SECTION I

INTRODUCTION

1. The Army horse breeding plan for the improvement of the riding horse was put in operation in 1920. At present 700 stallions are standing in charge of civilian agents throughout the United States, under general supervision of remount officers. Much valuable information and instruction in breeding has been passed on to the breeder in this way and the worth of the plan has been proved beyond question.

2. The greatest problem facing breeders is the procurement of suitable breeding stock. Since the World War, the Army horse breeding plan operated by the remount Division of the Quartermaster Corps has, by placing carefully selected registered stallions throughout the United States, made it possible for breeders, with little effort and expense, to breed some of the best horses in the world.

3. That Government stallions might be more appreciated and used to greater advantage and profit, the following suggestions to agents and breeders are offered. These suggestions are not intended for breeders who devote their time exclusively to the production of horses

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for special uses; rather, they are intended for the average farmer or ranchman who breeds primarily for his own use and who does not permit his horse breeding to interfere with the normal routine of his establishment.

4. The good half-bred horse has proved an ideal animal for general farm work as well as for riding. The half-bred is used in great numbers for polo, hunting, and cross-country riding. He is the ideal horse for Cavalry and light Field Artillery. The production and improvement of the half-bred horse is the principal object of the Army horse breeding plan.

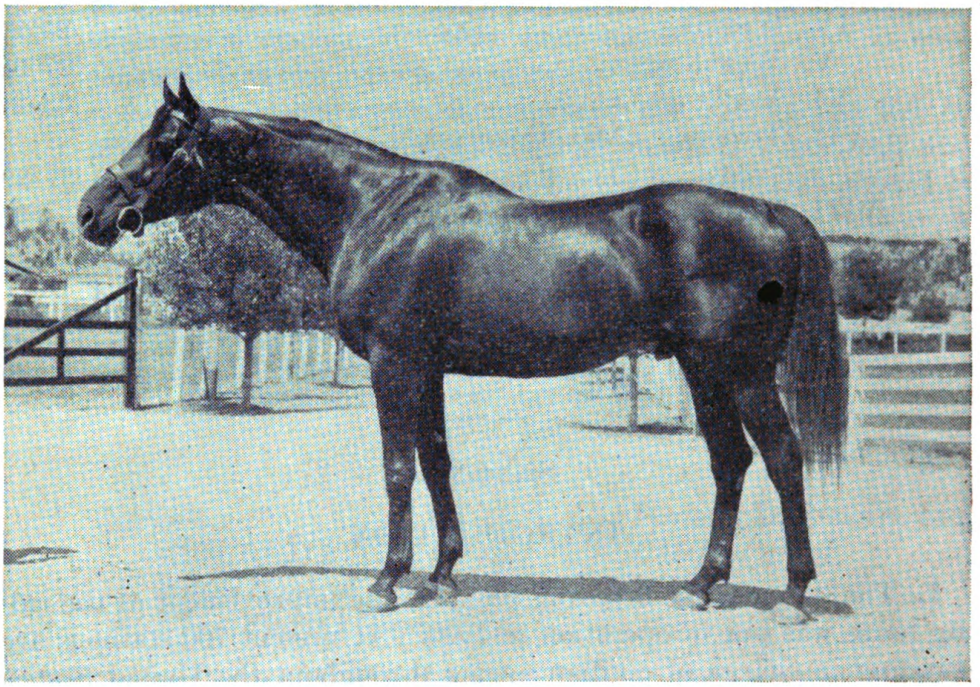

FIGURE 1.—Excellent type thoroughbred stallion.

5. The foundation on which all improvement of breeds is built is a careful, accurate record of breeding—a stud book in which the requirements of registration have been carefully and sanely put together with only one object in view, that being the development of a better, more useful animal. Such records and stud books are now published for all established breeds. The stud book makes for breed purity; it certifies to a line of descent from good horses and is a most important factor in improving both the thoroughbred and half-bred horse.

6. Breeders should register both their thoroughbred and half-bred foals and should retain their best fillies for brood mares. In no other way can the brood mares throughout the country be improved.

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7. Registration of foals should be made as follows:

a. American Stud Book (The Jockey Club, 250 Park Avenue, New York City).—Foals by thoroughbred or Arabian stallions registered in the American Stud Book, out of registered thoroughbred mares.

b. Half-Bred Stud Book (American Remount Association, Otis Building, Washington, D. C.).—Foals by thoroughbred or Arabian stallions registered in the American Stud Book, out of other than registered thoroughbred mares, and foals by registered stallions of recognized breeds other than thoroughbred or Arabian registered in the American Stud Book, out of registered thoroughbred mares.

8. This manual is based on procedure practiced with success at Army remount depots and many private breeding establishments. It is hoped that it will be found helpful and practical to breeders using Government stallions.

SECTION II

STALLIONS

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Exercising and conditioning	12
Feeding	13
Shoeing and care of feet	14

9. General.—*a.* The selection of the stallion is most important. A stallion with a good front, fine head, long sloping shoulder, well-defined withers, short back, deep girth, well-sprung ribs, strong loins, powerful croup, good, straight, well-placed legs with plenty of bone below the knees and hocks, and free from all transmissible unsoundness is desired.

b. In addition, every stallion should be a good mover; too much emphasis cannot be placed on the way a horse moves. A smooth, perfectly moving stallion is greatly preferred, though not so pleasing to look at, to one which is a model in repose and awkward in motion.

c. Disposition is an all important factor in producing horses for any purpose. One must not, however, confuse a bad disposition with a spoiled horse. The truly bad disposition will be inherited, but the spoiled horse will not pass on his vices.

d. Even though a stallion possesses all of the above good qualities, great care must be exercised in locating him in a community which has mares suitable to mate with him. The average farm mare is straight shouldered and round-barreled with short ribs. Therefore, it is necessary to mate her with a sire which is especially good in these points.

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While a compact, husky horse is desirable for all types of work, it is believed that a sire on the leggy side will mate well with the usual farm type mare. When breeding to thoroughbred or standardbred mares, a big-bodied stallion on short legs should always be selected. Numerous other combinations must be considered, but these show the importance of care in selecting the stallion for a particular mating.

e. Remount thoroughbred stallion Gordon Russell, by Marchmont II out of Tokalon, she by Tammany. Bred by J. W. Fuller, Wills Point, Tex. Age at time picture was taken, 21 years; age at time of death 27 years, Gordon Russell having been foaled in 1910 and having died

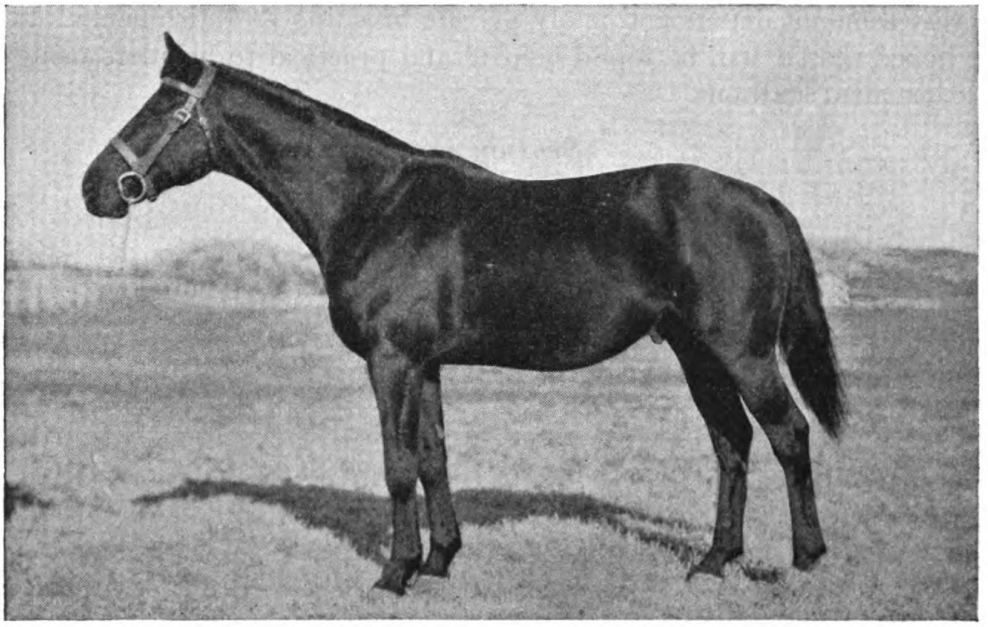

FIGURE 2.—Excellent type for producing remounts. (Irish, bay horse, 1926, by the Finn out of Ohone by Polymelian. Height 16 hands; weight 1,125 pounds; girth 73 inches: bone 8½ inches.)

July 6, 1937. Height 16 hands; weight 1,100 pounds; girth 72½ inches; bone 8 inches. Gordon Russell proved himself to be one of the best sires ever in stud by the United States Remount Service. He is an excellent example of conformation, balance, and performance. He raced in this country and in Cuba until he was 10 years old and retired sound. During his career on the track he won 97 times at various distances. He was placed in stud at 11 years of age and served and settled mares until the year of his death. His sons and daughters have performed brilliantly on the Army Equestrian Team, in the show ring, in Army maneuvers, and in the hunting field; they have also proved themselves to be high class breeding stock. His get were level-headed, sound, of good conformation and balance, possessed great

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courage and endurance, and proved to be very popular for both Army and civilian use. Stallions of the Gordon Russell type are the kind most desired by the remount service. Stallions of his size, balance, type, and conformation may be counted upon to be of more value than larger, awkward, and unbalanced stallions. The expression of head, eye, and lips of a stallion gives a glimpse into his soul. Note the intelligent, courageous, and determined look in the head of Gordon Russell.

FIGURE 3.—Remount thoroughbred stallion Gordon Russell.

10. Preparation of boxcar for shipping.—The stall in a boxcar should be such as to allow the stallion freedom of one-third the car. The front should be boarded off with 2- by 6-inch material to a height of 5 feet 6 inches. This partition should be set between slots formed by 2- by 4-inch material. When the railroad officials have no objection, the stall should be heavily bedded with straw. When in the opinion of the railroad officials such procedure constitutes a fire hazard, the stall should be sanded to a depth of at least 3 inches. A generous supply of hay should be placed in the stall, and enough baled hay placed in the car to last the stallion throughout his trip.

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A watertight barrel should be securely wired to the front corner of the stall and filled with water just before shipment is made; a splash block should be allowed to float on top of the water. Notation on the bill of lading should read: *Not to be unloaded—Feed and water in car.*

11. Stable and corral.—*a.* That the greatest success may be obtained in the production of horses, it is essential that the stallion be in the best possible condition at the beginning of the breeding season. This requires careful management throughout the year. First in importance in maintaining a stallion in good condition is the quarters in which he is kept.

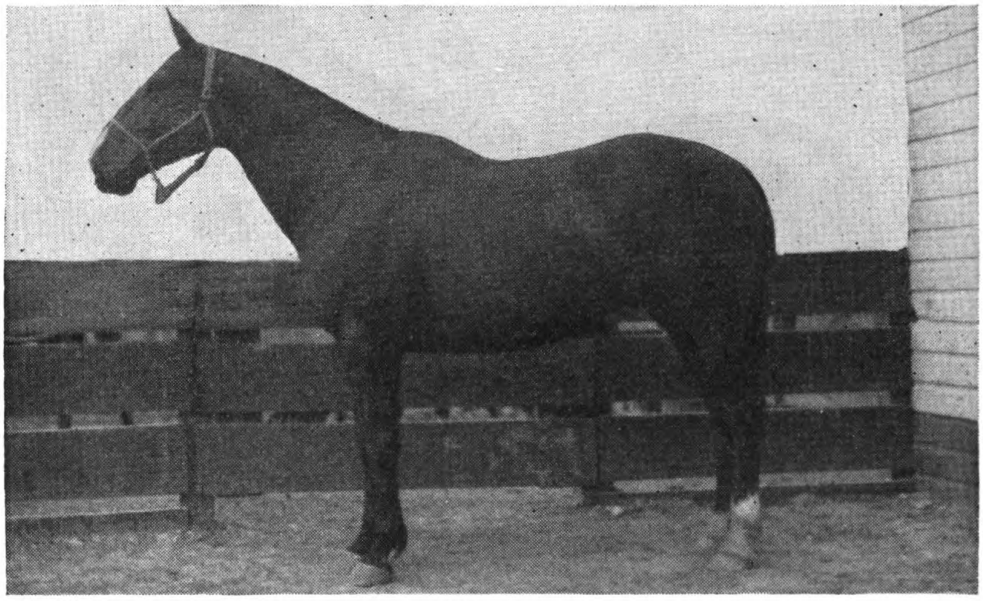

FIGURE 4.—Excellent type cavalry horse.

b. The stable for a stallion need not be elaborate but it should be well-lighted and ventilated, dry, and provide a box stall at least 14 by 14 feet. It is important that every part of the stall be high enough so that it will be impossible for the stallion to strike his head.

c. No matter what type of stall, there should be nothing on which the stallion can injure himself. Stallions often kick in their stalls; therefore, the construction should be such that these kicks will not break any part of the stall. thus creating a hazard on which the stallion might injure himself.

d. The floor of the stall should be of good hard clay with a very gentle slope toward the door. The stall should be cleaned every day and plenty of good clean straw or other bedding supplied every night. Horses do better if they have comfortable bedding which

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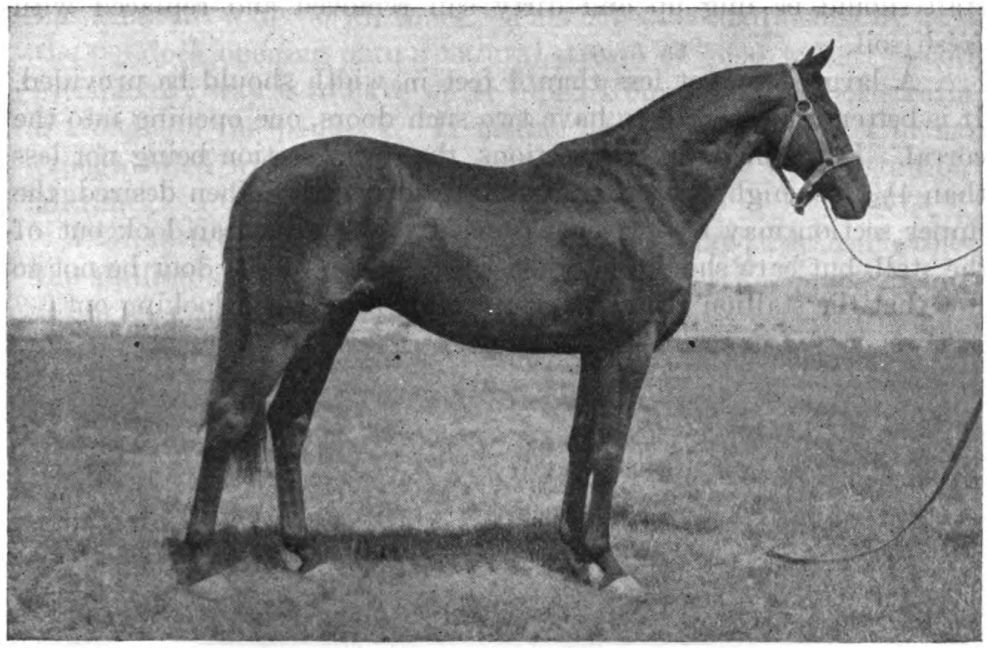

FIGURE 5.—Stallion in excellent condition—before being issued to an agent. (Fitzgibbon, brown horse, 1919, by Huon out of Rosslare. Picture taken in March 1933.)

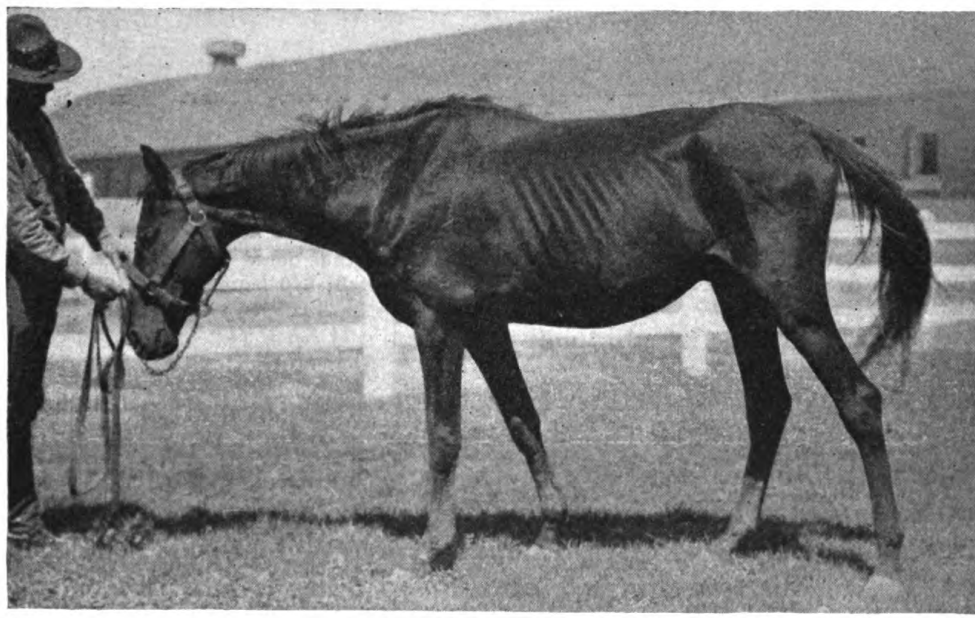

FIGURE 6.—Condition of stallion after being in hands of a poor agent. (Fizgibbon. Picture taken Aug' 7, 1934—shows what neglect will do to a stallion in a short time.)

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encourages them to lie down. About once a year the floor of the stall should be dug up and dirty soil removed and replaced with fresh soil.

e. A large door not less than 4 feet in width should be provided. It is better for the stall to have two such doors, one opening into the corral. Doors made in two sections, the lower section being not less than 4½ feet high, are preferable to solid doors. When desired, the upper section may be left open so that the stallion can look out of the stall, but care should be taken that the top of the door be not so low that the stallion is liable to injure his head when looking out.

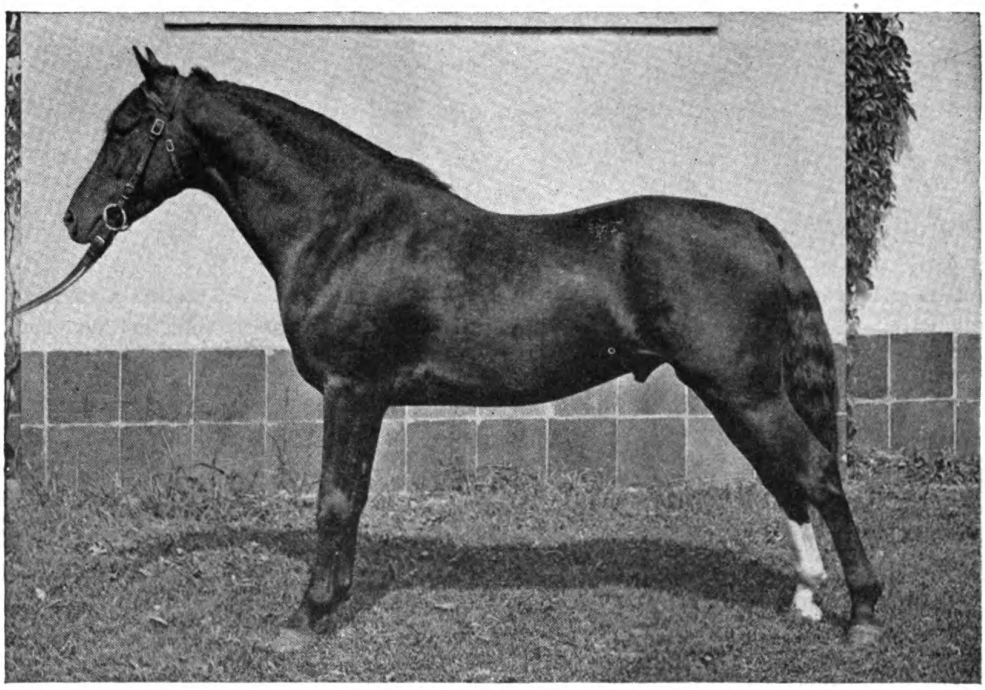

FIGURE 7.—Excellent type Morgan stallion. (Melbon, chestnut horse, 1932, by Ulysses out of Melba by Jerome Morgan. Height 14.2½ hands, weight 840 pounds, girth 67 inches, bone 7 inches.)

f. Adjoining the stall there should be a large corral, fenced in such a way that the stallion cannot injure himself or will not be tempted to jump out. On many ranches a 6-foot pole fence has been found to be satisfactory. Other types of fences which are satisfactory are board fences and very strong woven wire fences, preferably cyclone wire with an inch mesh, and having a pole or board along the top. Barbed wire should never be used to fence a stallion's corral. If stock, especially mares, run in adjoining fields or paddocks, a double fence is most necessary.

g. The larger the stallion's corral, up to 3 or 4 acres, the better. Every effort should be made to have the paddock not less than 300 feet

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on a side. If possible, the paddock should be so placed that the stallion has access to water at all times. This is best accomplished by having the paddock opening onto a natural stream of good water. Another satisfactory way is to have water piped from a windmill or stream to a trough in the paddock. If neither is possible, a bucket or small trough filled with good water should be available to the stallion at all times.

h. In severe weather, especially in winter, it may be desirable to keep the stallion shut in his stall at night. At such times care should be taken that the horse has all the water he desires. Even though the weather is cold and stormy, a stallion should not be kept shut in his

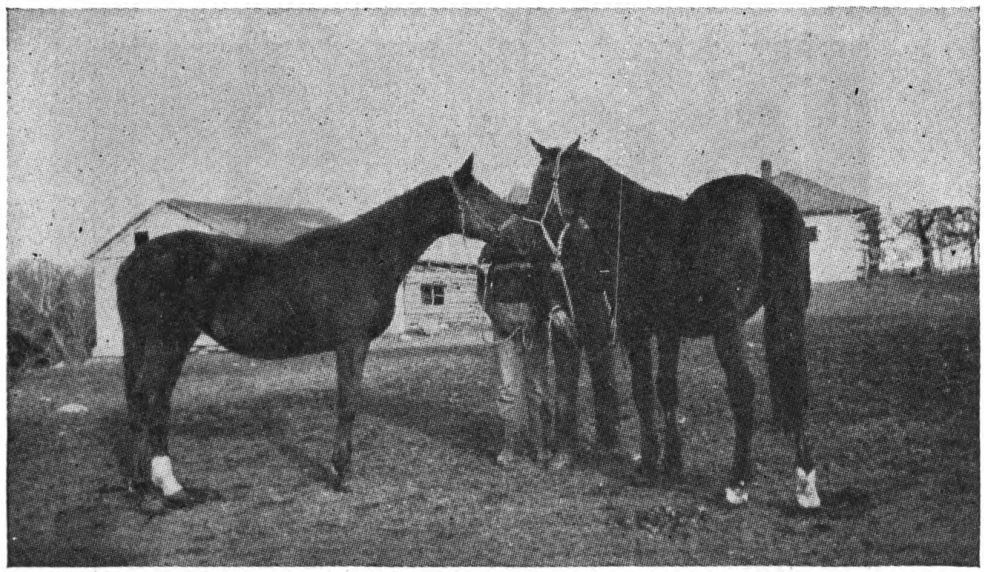

FIGURE 8.—Half-bred yearlings by a remount stallion. (Raised in the West, they are 1 year and 7 months old. The one on the left—Height 15 hands; weight 950 pounds. The one on the right—Height 15.1 hands; weight 1,020 pounds.)

stall during the day. He should be turned into his corral where he can exercise himself, and the stall door should be left open so he can go to and from his stall as he pleases. If grass and shade are available in the corral, so much the better.

12. Exercising and conditioning.—*a.* This subject naturally divides itself into two parts—during the breeding season and between breeding seasons. This is necessary because a stallion should be in his very best condition during the breeding season, whereas, between breeding seasons he should be kept in a good healthy condition, but not necessarily in as excellent or as hard condition as is desired during the breeding season. Stallions should be in good flesh at all times.

b. About 6 weeks prior to the breeding season, the stallion should be exercised daily under the saddle. When properly handled, stal-

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lions will nearly always prove to be gentle, kind, and dependable horses, but if abused, soon become dangerous.

c. The exercising should start with short periods of slow work and increased gradually until in about 2 weeks the stallion is receiving an hour's exercise daily. Fast work will not be given. The walk and trot are the gaits which will be used. If the gallop is used, it should not be very fast and only for short periods. After the stallion is exercised, if he is hot, he should be rubbed down and cooled off before he is put up. A lot of work can be saved in this respect if the ride or work is so arranged that the stallion is brought in cool, in which case he can be brushed off and turned into his corral. All exercising should be completed before the breeding hour.

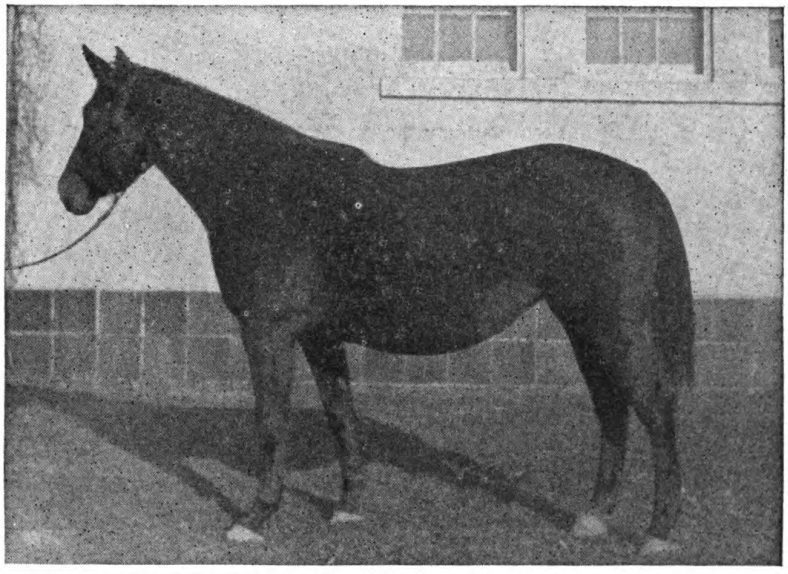

FIGURE 9.—Fair half-bred brood mare. (Plenty of bone but slightly calf-kneed and too short of rib.)

d. It is necessary for the best health of the stallion that he be groomed once a day. This should be done with a good, stiff brush, and a lot of force should be applied. This will stimulate the secretions of the skin as well as clean the animal.

e. The exercise of a stallion between breeding seasons should be sufficient to keep the stallion in a good, healthy condition. Stallions should not be too fat, but should be in good flesh.

f. Some stallions take sufficient exercise of their own accord; others do not and must be exercised by riding.

g. The condition of the stallion should be carefully watched. If he shows lack of condition, a careful examination should be made. Very often a stallion, although properly fed, may not do well. This may be

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due to any one of many causes, the most common of which are lack of exercise, bad teeth, or worms.

h. Most stallions get into poor condition because their owners or agents do not give them reasonable care. It does not require an expert to keep a stallion in good condition, but it does require the conscientious application of a few simple rules.

i. If the stallion does not do well, a veterinarian should be consulted and his advice followed.

13. Feeding.—*a.* All stallions cannot be fed alike. Some stallions are good keepers; some are not. Each stallion will have to be carefully studied and fed according to his special requirements.

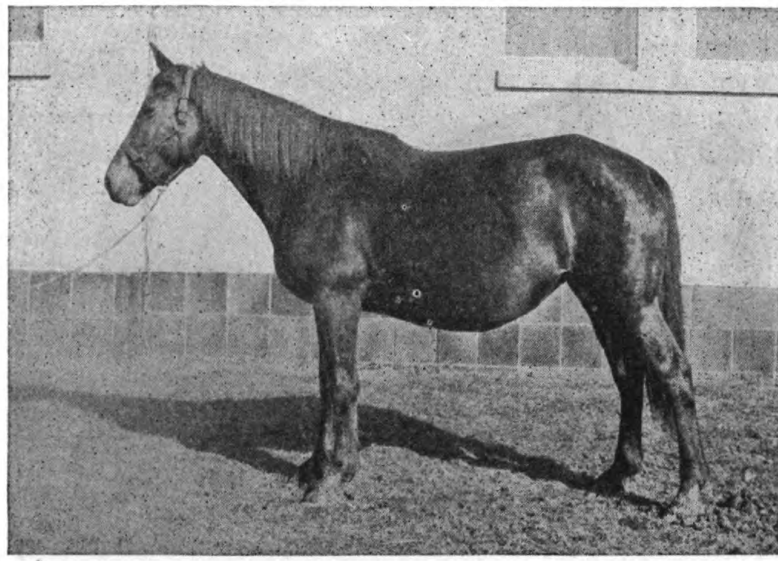

FIGURE 10.—Poor half-bred brood mare. (This mare, while having good legs with plenty of bone, has a plain head and straight shoulders. She has ample heart girth and length of rib, but a poor croup.)

b. During the breeding season, a stallion should be fed more than between breeding seasons. This is due to the energy expended serving mares and the additional exercise he is given during the breeding season.

c. Special foods are not necessary to keep a stallion in good flesh. Any grain or hay commonly fed to horses is suitable for stallions. At many ranches, it is impossible to feed as prescribed by many authorities on the subject. Substitution of feeds available in the locality must be made and this is to be expected. However, great care should be taken in such substitutions. Changes in feed must not be made suddenly, as this invariably results in sickness.

d. Most stallions purchased by the Government have spent their early years in luxurious surroundings, abundantly fed, and constantly

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attended. They find the conditions in many places where placed for stud duty quite different from what they have been accustomed to. Upon receiving a new stallion, one should study his previous history and should help him adjust himself gradually to the new conditions in order that there will be as little loss of condition as possible. If changes are made rapidly and violently, an unsuccessful breeding season is almost certain to follow and the horse will be unjustly condemned as a stud.

e. Stallions should have all the hay they will eat, both during the breeding season and the period between breeding seasons. The kind of hay to be fed depends upon the hay available at the ranch

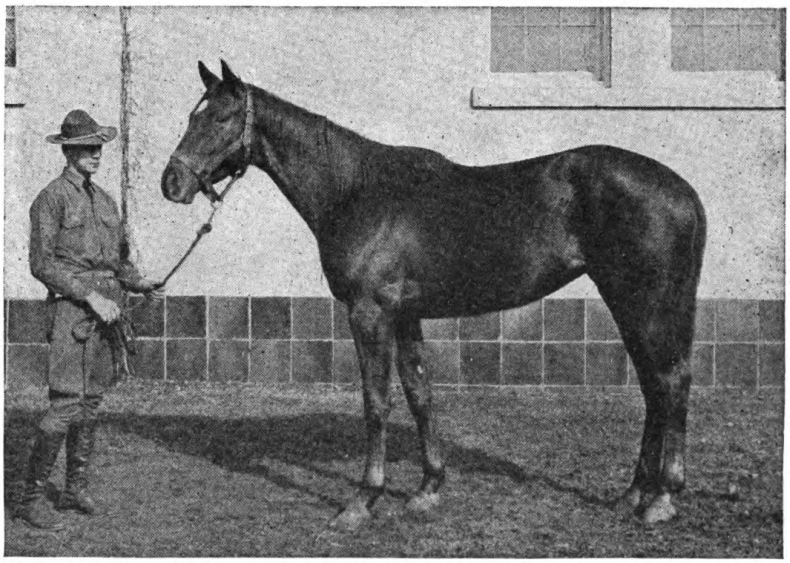

FIGURE 11.—Poor type for brood mare. (A very attractive thoroughbred filly with excellent head, neck, and shoulder, but too light below the knee as well as calf-kneed, short-ribbed, wasp-waisted, and has bad croup and hind legs—should not be used as brood mare.)

or farm. If practical, one-third to one-half of the hay should be alfalfa, clover, or some similar leguminous hay, and the remainder should be wheat grass, upland prairie, timothy, oat, or some similar hay.

f. As to grain, from 10 to 15 pounds a day in three feeds should be fed according to the requirements of the individual stallion. During the breeding season, it is very unusual for any stallion to require less than 10 or more than 15 pounds of grain.

g. This grain should consist of a mixture containing oats and bran. The other part of the mixture will depend upon the grain available at the ranch or farm concerned. Cracked corn or ground barley and linseed or cottonseed meal should be added to the oats and bran.

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Barley and corn have about the same value, and either can be substituted for the other. Linseed and cottonseed meal have about the same value and one can be substituted for the other. Both corn and barley are heat producing feeds and ordinarily should not be fed except during the cold months.

h. From about October 15 until about March 15 or April 1, depending upon the climate, the mixture of the grain should be approximately as follows:

40 to 50 percent rolled oats.
20 to 30 percent cracked corn or ground barley.
20 percent bran.
10 percent linseed or cottonseed meal.

i. The colder the weather, the more corn or barley may be fed, but the amount of oats should never be reduced to less than 40 percent of the entire mixture. In some breeding establishments, a mineral mixture is fed, but it is not considered that this is necessary on the average farm or ranch. Salt is of course absolutely necessary to all stock at all times, and many breeders strongly recommend bonemeal mixed with granulated salt. This mixture should consist of one-third bonemeal and two-thirds salt, and can be easily fed to the stallions by placing it thoroughly mixed in a suitable trough in the paddock where the stallion runs.

j. The feeding of the stallion during the nonbreeding season should be approximately the same as during the breeding season. He should be fed three times a day, but the total amount of grain fed each day should be reduced approximately 3 to 5 pounds from what he has been receiving during the breeding season.

k. Salt should be supplied at all times, both in the corral and in the stallion's stall.

14. Shoeing and care of feet.—Stallions should be allowed to go without shoes at all times if their feet will permit it. But they must not be allowed to go sore during the breeding season and, therefore, many horses require shoeing at that time. As soon as the breeding season is over, shoes should be pulled and even though the stallion becomes sore, he should be left unshod as this will help grow better feet. A daily inspection of feet should be made for nails and stones, and signs of disease such as thrush, canker, etc. Feet should be trimmed and leveled at least once every 2 months, if barefooted; and if shod, shoes should be reset as often as necessary to keep the feet in perfect shape and condition.

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SECTION III

BROOD MARES

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15. General.—*a.* Breeders should realize that the production of horses is a partnership arrangement between the mare and the stallion, and that the type, quality, substance, and health of the foal depends jointly on the qualities of the stallion and the mare. Horses of the proper type, substance, and quality cannot be produced by mares and stallions of poor type, nor can good foals be produced from stallions and mares that are not in good condition and good health.

b. The mare is more than 50 percent of the foal, and although the stallion is responsible for one-half the inherited characteristics, the mare must furnish sustenance for the foetus and nurse the foal; therefore, she is responsible for his development until weaned. It is appreciated that most breeders are forced to breed the mares they have, but in order to make horse production profitable, every stockman should eliminate bad mares, and replace them as far as possible each year with better young mares.

c. Too many breeders assume that the stallion can do it all by himself, and are disappointed when they fail to get good foals by an excellent stallion out of poor mares.

d. The greatest care must be exercised in selecting brood mares. The following points should be given serious consideration:

(1) Disposition is most important. Select kindly tempered mares, the kind which go about their work willingly and without excitement. Do not breed unbroken mares. Until a mare has been used, her temperament is unknown. Many horses are perfectly gentle until they are required to do hard or fast work. Breed mares which do willingly and quietly everything required of them. Few can afford the luxury of idle brood mares; therefore, mares that can be used in the daily work of the farm or ranch are most desirable.

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(2) Select mares which are attractive to the eye; with excellent heads; smooth, clean, well-placed, and straight legs; and which move well at all gaits.

(3) Select rugged mares which always appear thrifty under all conditions and carry a large belly, well let down in front of their stifles at all times. In other words, a strong, healthy, roomy mare.

(4) Select mares which are large, but not of great height with slender bodies. The latter type is leggy with little substance. Rather, take mares with large girth, well-sprung, well let down ribs, and plenty of bone below the knee and hock.

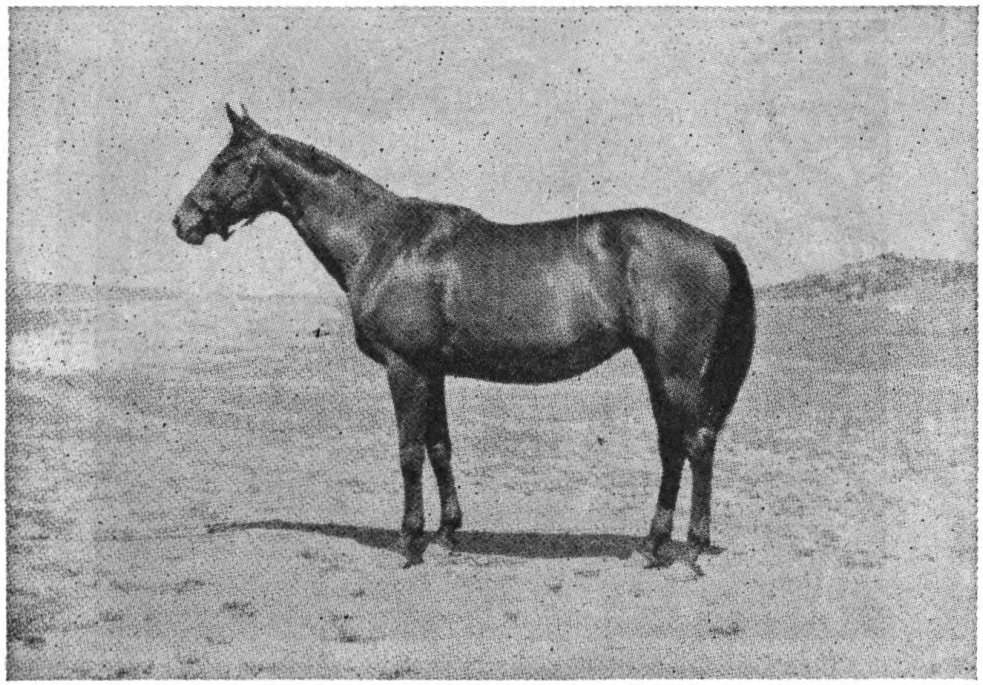

FIGURE 12.—Excellent thoroughbred brood mare. (Thoroughbred brood mare Stamp Act, bay, 1929, by Axenstein out of Postage. Lots of quality, excellent head, neck, shoulder, back, and croup. A roomy mare with good legs. Could be better below the knee. This mare is a beautiful mover and a proved producer.)

(5) Select mares which are good milkers and do not neglect their foals; mares that are good mothers. When a mare has proved herself to be a bad mother, she should be discarded.

(6) Select sound mares; mares free from transmissible defects. This is just as important in the selection of a brood mare as it is in the selection of a stallion.

(7) Mares of known ancestry are desirable. The more purebred horses known to be in a mare's pedigree, the less chance of a throwback to a plug. For this reason, registered mares are especially to be desired. Every breeder should look forward to having all

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mares in his brood mare band registered. Only in this way does one know what he is doing.

e. Save your best fillies for brood mares. Dealers and buyers who consider the future welfare of the horse industry should see that the best mares are left in the country as brood mares.

f. Breeders should keep an accurate record of all brood mares. Such a record should include everything known of the mare's history and breeding; also her breeding record and what is known of her produce. Only through such records can proper matings be made.

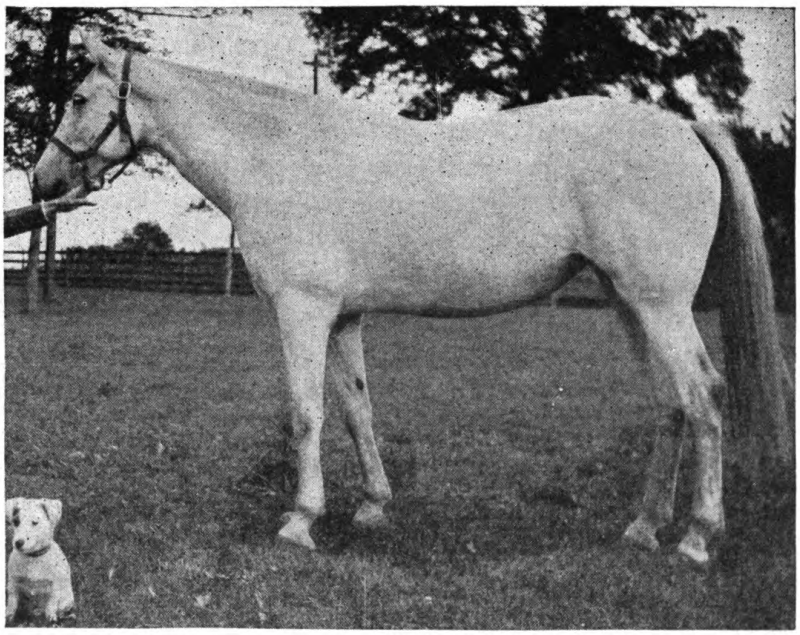

FIGURE 13.—Good type half-bred mare. (Such a mare bred to good type thoroughbred stallion should produce good hunters.)

g. The following illustrations show excellent type thoroughbred and half-bred brood mares.

16. Care and feeding before foaling.—*a.* Brood mares can be kept in the best breeding condition by a well-balanced system of feeding and exercise. The feeding and exercising should be so regulated as to keep them in a thrifty and vigorous condition. The ideal conditions are those of mares in pasture. A large proportion of horses, however, are produced by farmers who work their brood mares. There is no objection to this if they are not worked too hard and are given careful attention. In fact, it is preferable to work the mares rather than to allow them to stand idle in stables where they get too little exercise.

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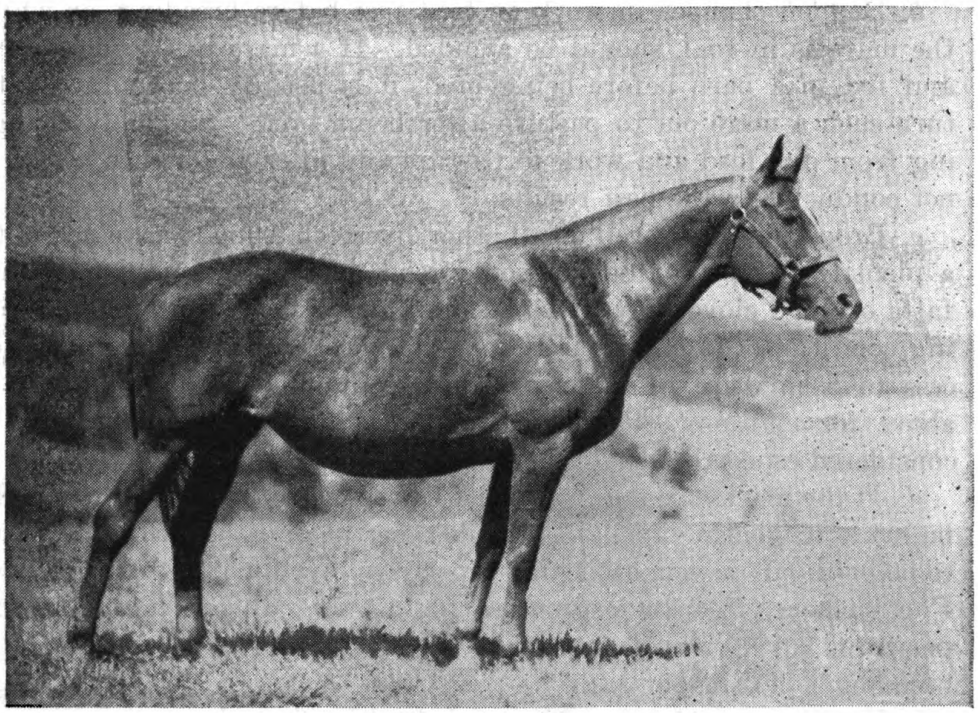

FIGURE 14.—Excellent type thoroughbred brood mare. (7K94—Divinity. Abbot's Trace—Quite Dark she by Alphea II.)

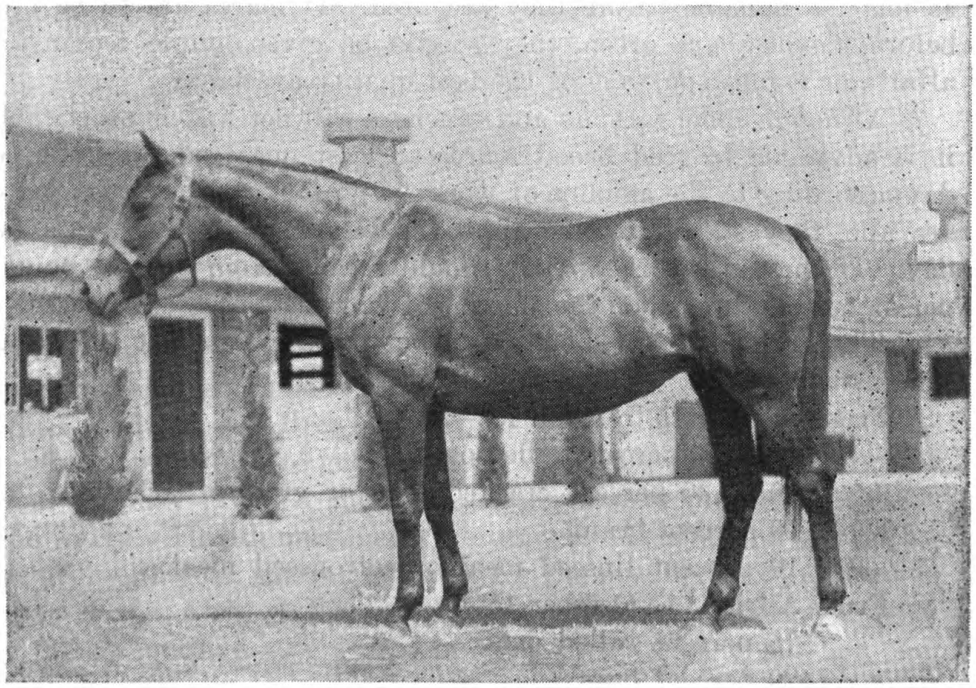

FIGURE 15.—Excellent type half-bred brood mare. (A proved producer of Army horses. D440—Annabell by Esquire.)

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b. Sudden changes in work or feed just before breeding, or while the mare is in foal, should be avoided. If a mare has been worked and fed in a barn before being bred, it is usually poor practice to turn such a mare out to pasture after being bred. Suddenly changing from dry feed and work to pasture and idleness, or vice versa, is not conducive to the best results.

c. Brood mares, as well as all other livestock, should have access to a plentiful supply of hay or some good pasture or both. Good alfalfa or good clover hay will assist in putting mares into good breeding condition. It is especially important that brood mares have access to a mixture of bonemeal and granulated salt, as explained above for stallions. Phosphorus, which is present in bonemeal, is considered especially desirable for brood mares.

d. If the mares are not gentle and halter-broken, every effort should be made to gentle and halter-break them prior to the time they are to be bred. It is very difficult properly to breed mares that are wild. Furthermore, when a wild mare foals, great difficulty will be experienced in gentling the foal. It does not pay to permit any breeding stock to be wild.

e. Brood mares should be in good, healthy flesh, but not rolling in fat, at the time of breeding. If the breeding season is such that green pastures are available, brood mares should have access to them as long as possible before they are bred. If mares are to be bred before pastures are green, they should be given ample feeding of alfalfa or leguminous hay of the best quality available.

f. Although some farmers and ranchers will not find it practicable, it is advisable to feed brood mares at least one feed of grain per day according to the amount of work they perform. If brood mares are idle, they should receive approximately 4 pounds of grain per day. If they are worked, they should receive from 6 to 10 pounds per day, depending upon the amount of work.

g. The grain mixture should be about the same as that for a stallion, namely—

From October 15 to April 15—
- 40 to 50 percent rolled oats.
- 20 to 30 percent cracked corn or ground barley.
- 20 percent bran.
- 10 percent linseed meal or cottonseed meal.

From April 15 to October 15—
- 75 percent rolled oats.
- 20 percent bran.
- 5 percent linseed meal or cottonseed meal.

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It will be noted that the cracked corn or barley, heat producing feeds, are omitted during the warmer months.

h. The condition of brood mares while carrying foals is of extreme importance. The 6 months before a foal is dropped is as important from the standpoint of his development as any 6 months of his life. During this time, the mare is responsible for furnishing everything necessary for his development and growth; therefore, she must receive the best of care and be in the best of health, or else the foal will suffer.

17. Care of feet.—Except in most unusual cases, brood mares which run in pasture the year round should not be shod. Their feet,

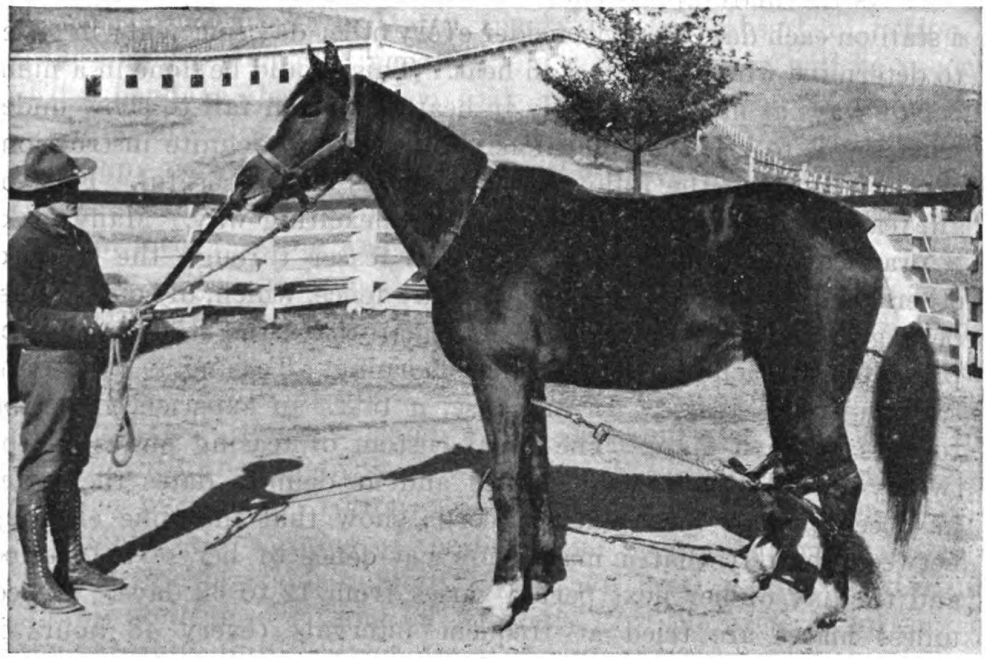

FIGURE 16.—Brood mare prepared for breeding. (Twitch, hobbles, and tail bandage properly applied.)

however, should be inspected at regular intervals, trimmed, and leveled to keep them in good condition.

18. Breeding.—*a.* Breeders are often too willing to blame the stallion when a mare fails to get with foal. If a mare is not healthy and normal she may fail to conceive although bred to the surest stallion in the world. Health means everything. Even though an unhealthy mare gets with foal, she is a bad risk for the production of a normal, healthy foal. Also, if the breeding is improperly done, the mare may fail to conceive.

b. It is generally conceded by experts that the best time to get a mare in foal is during her first heat period after foaling. If the

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mare has not been torn and seems to be normal, she should be returned to the stallion during her first heat period. This may occur anywhere between the seventh and fifteenth day. Exact date should be determined by teasing. In the majority of cases, this will be on the ninth or tenth day after foaling.

c. In taking up the subject of breeding plans must first be considered for presenting mares to stallions when they are in heat. A systematic plan in this respect will save much time and trouble. There is no more important part of breeding than teasing and great care to tease properly should be taken.

d. As the mare approaches her season it is best to present her to a stallion each day (many consider every other day sufficient) in order to determine when she comes in heat. This should be done in a number of ways as mares definitely in heat will often fail to show under what seems to be ideal conditions; therefore, no definite instructions can be given, but the following suggestions may be useful. First of all, teasing must be done in a gentle, nonexciting way. Many make a practice of riding the stallion or a teaser through the pasture, others lead the stallion along the pasture fence, which, of course, must be a good fence. Where there is a mare barn the stallion may be presented at each stall every other morning. Teasing is hard on a stallion—use a teaser. In any case, it takes an experienced person to pass on each mare. The usual custom of teasing mares on the twenty-first day following service and at definite dates thereafter has been proved inefficient. Records show that the time elapsing between the day that a mare shows evidence of her sexual period and the day of her next period varies from 12 to 32 days. Hence, unless mares are tried at frequent intervals (every 48 hours is recommended) heat periods are often missed.

19. Hand breeding.—*a.* This is undoubtedly the best way to breed. It is used by the best breeding establishments throughout the world. It not only guards against injury to the mare and stallion, but is the surest way to get mares in foal. Many breeders, especially in the West, object to hand breeding because of the time and care required. It is realized that some ranchers and farmers will find it difficult to hand breed, but they will also find that the results will more than pay them for their time and trouble.

b. For hand breeding a shed or breeding corral is provided. The mare having been determined to be in heat is brought to the breeding shed or corral. If practicable, the mare should be placed in a narrow stall in the breeding shed or corral, the construction being such that neither the mare nor the stallion can hurt one another or themselves.

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c. The stallion is led in to the mare on a halter; the mare in the teasing stall is also held by a halter. The stallion is allowed to tease the mare but not permitted to get rough. Some rough stallions frighten mares and will cause them to refuse to accept the stallion. The mare should be comfortably relaxed when bred, as such a condition is more conducive to conception.

d. After the mare shows signs of making up to the stallion she usually empties her bladder. The stallion should be taken to one side or out of the breeding shed. The mare is then taken out of the tight stall in which she was placed during the teasing and is washed off. For washing the external genitals of the mare, two buckets of clean warm water, plenty of clean absorbent cotton, a cake of pure nonirritating soap, and a tail bandage will be needed. First bandage the tail, then soak a piece of cotton in water and make a lather by rubbing the soap on the cotton. With this piece of soapy cotton thoroughly lather the vulva and all surrounding parts including the buttocks. Throw this piece of cotton away, soak a clean piece in water and with this wash away all the soap. Never put any cotton back in the bucket after it has touched the mare. Repeat this process until the mare is clean. Next dry the external genitals with dry cotton. Then with a new piece of clean wet cotton wash out the lips of the vulva. Do this by parting the lips with the fingers of the left hand while squeezing the water from the cotton with your right so it will enter the vulva. Then with still another piece of dry cotton wipe the inner surface of the vulva lips.

e. Unless the washing of the mare and stallion is carried out in a truly hygienic manner, more harm than good is likely to result. Merely wetting or rinsing off will only give the bacteria lurking in the naturally filthy surroundings of both the vulva and the penis a more ready entrance into the genital tract during service.

f. Under no circumstances allow anyone other than a trained veterinarian to place his hand in the vagina of the mare. The practice of "opening-up" mares cannot be too strongly condemned. As a result of this so-called "opening-up" many mares become infected and fail to get with foal, and often become hopelessly sterile.

g. The stallion should also be washed—the penis should always be perfectly clean before service. Any nonirritating soap (castile or ivory) can be used for this purpose. After washing with soap, the penis should always be rinsed off with warm clean water.

h. The mare should be hobbled for the protection of the stallion. Most mares which can be hand bred can be hobbled without trouble. Hobbles are used only to protect the stallion as he approaches and

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leaves the mare, and not in any way to force the mare into submission to service when not ready. Breeding a mare that is not absolutely ready is not only a wasteful service, but damaging to the future breeding efficiency of the mare. If it is necessary to use a twitch on the mare for breeding, it should be removed as soon as the stallion has entered the mare. This in order that the mare may relax. The cover, if possible, should be made in the same place each service, as the stallion will behave much better in familiar surroundings. The same man should always handle the stallion at time of service.

i. The stallion must always be kept under strict discipline at this time and never allowed to rush a mare. He must be made to approach the mare quietly and mount at the command of the stud groom. Above all things, the stallion must be allowed to remain on the mare until the sexual act has been completed. Many stallions are ruined for the stud by the practice of pulling them off the mare before they have finished the act. As soon as the stallion dismounts the mare should be walked for approximately 10 minutes so that she will not strain and endanger her chances of conception. The prophylactic treatment for the stallion should be given as soon as he dismounts. This consists of washing the penis in a nonirritating antiseptic solution. Lugol's solution of potassium permanganate may be used for this purpose. This treatment will not only protect the stallion from breeding infections but will safeguard the next mare he covers. The stallion should be immediately returned to his quarters.

j. If the stallion is to last as a virile sire, eight covers per week during the breeding season should never be exceeded, and two covers per day should never be allowed on successive days. When two covers in one day are necessary the first cover should be early in the morning and the second late in the afternoon. Under no circumstances will covers be less than 4 hours apart. Each stallion agent should determine a definite breeding season for his stallion; a date before which he will not breed and a date on which the stallion will definitely make his last service. This is necessary in order that a stallion can be put in the best possible condition for his breeding season and definitely and systematically let down at a prescribed time.

k. Occasionally there is a stallion who serves his mare with no outward sign of having completed the sexual act. If the agent or owner is in doubt, a microscopical examination of the drip from the stallion's penis as he dismounts from the cover should be made. The presence of live spermatozoa will be definite proof.

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l. The stallion should be equipped with a stallion halter with a chain through his mouth, or with a stallion bridle which should have a straight bar bit. Mild, firm jerks will serve to correct the stallion when he becomes unruly or too impetuous. The force exerted should only be that which is required. Again it is cautioned that the attendant should not be rough. He should be patient and very firm. Stallions with proper treatment soon become well disciplined. Hand breeding is by far the best way to breed and requires very little extra time and trouble after one has learned to handle the stallion and mares.

20. Corral breeding.—*a.* Corral breeding is next best to hand breeding, but should be practiced only when hand breeding is impracticable.

b. The mare having been determined to be in heat is brought to a small corral so fenced that neither the stallion nor the mare can be injured. The mare is turned loose in the corral. The stallion is then brought to the corral and turned in with the mare. The mare and stallion are left alone until after the stallion has served the mare. Persons in attendance should not remain in the corral, but should take positions where they can see but not be seen.

c. After the stallion has covered the mare, she should be returned to her pasture and the stallion, after having been washed, as heretofore described under hand breeding, should be returned to his quarters. No remount stallion will be corral bred without authority from the officer in charge of the area.

d. One of the disadvantages of corral breeding is that the stallion is liable to be injured by being kicked, whereas in hand breeding the mare is hobbled.

21. Pasture breeding.—*a.* Pasture breeding consists simply of turning the stallion into a pasture with the brood mares he is to serve. Pasture breeding should be eliminated. It is a bad method both from the standpoint of the stallion and the foal crop. All stallions can and should be either hand or corral bred.

b. Very few stallions know enough to take care of themselves, and when injured their services are lost for the remainder of the breeding season. The stallion is very likely to overbreed himself and in this event, the end of the breeding season will usually find him sterile. Unless pastures are small and well-fenced, which is not the case where pasture or range breeding is most commonly resorted to, stallions are often dangerously cut on barbed wire or otherwise seriously injured. In pasture breeding, accurate breeding records are impossible.

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c. For these and many other reasons, pasture breeding is to be discouraged and, therefore, no agent having a stallion belonging to the Remount Service, Quartermaster Corps, is authorized to use him for pasture breeding.

d. Pasture breeding is, in most cases, only resorted to by breeders who place a very low value on their stallions, mares, and produce. Breeders who expect to raise horses which will demand fair prices use a better method.

22. Feeding and care of mares after breeding.—*a.* After breeding, mares should be turned out to the best pasture available where they will have access to good clean running water and plenty of salt mixed with bonemeal. As soon as practicable, the mares in foal should be separated from the barren mares. This is desirable for several reasons. Barren mares are more nervous and run more than mares in foal; therefore, excite the latter. Then too, the mares in foal need more attention and more feed than barren mares.

b. The mares in foal, in addition to good pasture, should be fed a grain mixture once a day amounting to about 4 pounds. It should be remembered that during the time of pregnancy the mare not only is sustaining herself, but also the unborn foal. If we are to expect the best results, the mare must be given sufficient nourishment to develop the foal properly before the date of birth. This feeding can be done in suitable troughs in the pasture itself, or the mares may be brought into a stable to be fed.

c. Brood mares should be kept free of intestinal parasites. In case it is practicable to worm only once a year, it is better to worm between the 1st of November and the 15th of December.

23. Abortions.—Abortions deserve serious consideration by all breeders. There is no doubt but that the percentage of abortions is larger than generally figured. Abortions are usually due to kicks; strains; slips; squeezing through narrow doorways or partly closed gates; excessive riding, driving, or pulling; and improper or moldy feed. A mare which has once been aborted is often difficult to get in foal. If of contagious character, abortion may wipe out an entire foal crop. There is available an abortion bacterin which has proved almost 100 percent efficient in the immunization of mares against contagious abortion, and should be used where indicated. When in doubt about the nature of an abortion, have a thorough examination made by a veterinarian. Good regular feed, moderate work or exercise, and careful handling should be given pregnant mares. This will help reduce the number of abortions.

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24. Foaling.—*a.* Breeders should give their foaling mares every possible consideration. Good common sense used at this time will bring big returns. If it is known that some of the mares are due to foal when the weather is bad, it is certainly advisable to prepare for them to foal where they can be properly cared for. If the weather is fine and warm, these precautions are not necessary. Therefore, a breeding record should be kept of each mare so that it will be known when she is due to foal in order that suitable arrangements can be made. The average time from the breeding date to the time of foaling is 11 months and 5 days. About a week prior to her foaling date, the mare's feed should be slightly reduced and the percentage of bran fed increased. Care should be exercised to see that mares with foal are not allowed to become too fat.

b. When it is observed that wax is forming on the teats and that a little milk can be extracted by hand, the mare will usually foal in a day or two.

c. If practicable, the mare should then be placed in a large box stall, not less than 12 by 12 feet, which does not contain hay racks, feed boxes, or other objects under which she might be caught or on which she might injure herself during the act of foaling. The ideal place on a ranch or farm would be such a stall opening onto a small corral where the mare could get a little exercise and have free access to salt and water. During this period the mare should be shut in her stall at night; the stall should be thoroughly cleaned, limed, and well bedded with clean rye, wheat, or oat straw.

d. The mare should be watched during the act of foaling but the observer should be careful not to disturb her or to attempt to assist her unless necessary to see that she does not get down in a corner of the stall; to observe if the foal is coming in a normal position, namely, both front feet and nose protruding; or to render assistance to the mare in foaling if necessary. Inexperienced assistance at this time is dangerous; efficient assistance invaluable.

e. If the cord does not break naturally, the attendant should break it by placing the thumb and forefinger on the cord about 2 inches from the belly of the foal, and then with the loop of the cord around the forefinger of the other hand, break it by pulling. The cord should never be cut or ligated (tied). The stump on the foal's belly should be saturated with tincture of iodine. This is best done by soaking absorbent cotton in tincture of iodine solution and holding this firmly over the stump for a moment or so. One application is all that is necessary for this purpose. This will prevent many

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cases of navel ill. This is usually all that will be necessary unless there are complications.

f. When the afterbirth is dropped, it should be removed from the stall; the wet and soiled bedding should also be removed and replaced with clean dry straw. It is a good plan to wash the mare's udder with soap and warm water, then rinse off with clean warm water before allowing the foal to nurse. Many forms of intestinal disorders in the foal may be prevented if the above procedure is followed.

g. The foal should be encouraged to nurse as soon as he is strong enough to stand. This nursing is very important, as the first milk (colostrum) is laxative and starts the foal's bowels functioning normally. Some breeders make it a routine practice to give the foal an ounce of castor oil in about 2 ounces of warm water before he

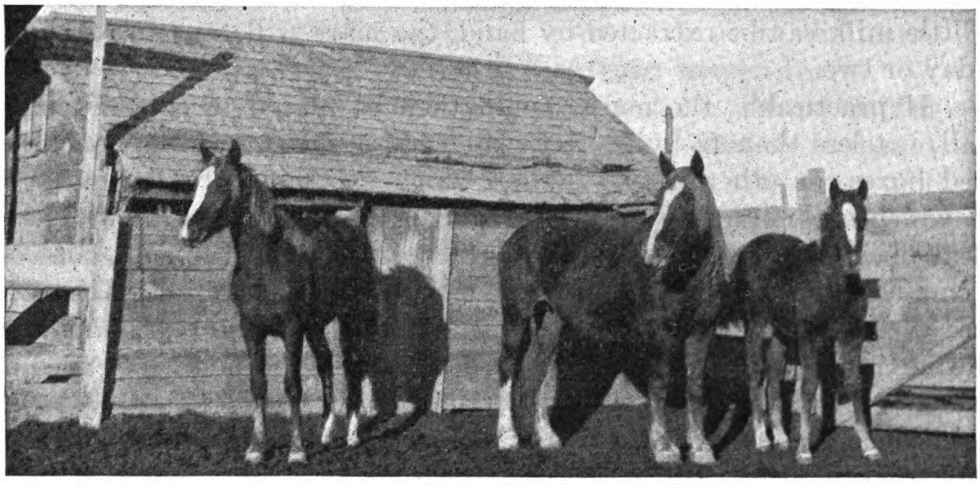

FIGURE 17.—A coarse mare. A good producer—the next generation will be a great improvement. Should start with better than this if possible.

first gets up to nurse. The foal should always be examined the morning after foaling to make sure the rectum is not stopped with balls of fecal matter (meconium). If the balls are present the foal should be given an enema of warm soapy water with just a pinch of salt added. This enema should be given gently, and repeated as often as necessary, until the bowels move naturally.

h. One hour after foaling, the mare should be given a half pail of warm water to drink. The first three grain feeds for the mare following foaling should be bran mashes to which should be added two tablespoons of coarse salt.

i. The foal should be placed in a small inclosure with the mare, for exercise, as soon as he is 24 hours old, depending of course, on the condition of the weather and the strength of the foal.

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j. If the arrangements above described cannot be provided, the next best arrangement is some sort of shed, protected from the north, in the pasture where the mare is ranging. This shed should be inclosed by a fence, and the mare placed in the shed where she has access to feed, water, and salt during the 2 or 3 days prior to foaling.

k. If this cannot be provided, the only other way is to allow the mare to foal in pasture. If this is resorted to, the pasture should be inspected daily to see if any mares have foaled and if any foals need attention.

l. If a mare foals when a person is not in attendance, these precautions cannot be taken, and the risk of losing the foal is, therefore, increased. However, if the presence of an attendant is not possible it is safer for the mare to foal in a pasture, if weather conditions are favorable.

m. If, after 6 or 7 days, the mare and foal seem to be progressing satisfactorily and the weather conditions permit, they should be turned into good pasture. The mare should be fed a grain mixture consisting of 20 percent bran, 75 percent crushed oats, and 5 percent linseed or cottonseed meal once a day.

n. Some ranchers and farmers will not find it practicable to feed grain during this period and, provided ample good pasture is available, lack of grain feed during this period will not prove a great disadvantage. However, it should be remembered that the mare is now sustaining not only herself, but also her suckling foal, and that for the proper development of the foal, it is very important that a mare have plenty of milk. This will not be possible unless she has sufficient grazing or other feeds.

SECTION IV

WEANING

Paragraph
Care of mare and suckling up to weaning 25
Weaning 26

25. Care of mare and suckling up to weaning.—*a.* After the mare has foaled, and both the mare and foal are progressing satisfactorily, the question of when to wean must be considered. It has been stated that foaling mares should be bred approximately 9 days after foaling, and if all goes well the mare, with a foal at her side, is again pregnant. We then have the mare not only sustaining herself and the suckling at her side, but also providing for the development of the foetus inside her. Such a mare must be provided

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with ample nourishment, otherwise she or one of her two foals, or probably all three, will suffer from the lack of proper nourishment.

b. As far as the foal at her side is concerned, it is best that he be weaned naturally by the mare, and when the mare is not with foal, it is perfectly proper to allow the suckling to run at her side until weaned naturally.

c. The main consideration which determines the time of weaning is an endeavor to be fair to the mare herself, the suckling at her side, and the unborn foal. The suckling should be kept with the mare long enough so that no material harm will be done to him by weaning, but on the other hand, he should not be left with the mare so long that he is taking nourishment which is needed by the foal she is carrying. Furthermore, we must be fair to the mare; she must not be required to feed herself and her two foals until the drain on her becomes so great that she herself begins to lose condition.

d. For the foregoing reasons, it has been found that weaning is necessary for good results when the mare is again in foal. As to the time to wean, a good general rule is that usually the foal should not be weaned before his fifth or later than his sixth month.

e. Fortunately, young foals are at their mother's side for the growing season of the year when access may be had to green succulent food. Provided a mare and foal are placed in good pasture where there is an abundance of nourishing grass of varied character, they will do well without any other feed. Of course, while in pasture they should have access to abundant clear water and salt.

f. It is preferable, if circumstances permit, also to feed to the mare and foal about 5 pounds of grain mixture once a day. This can be fed in troughs in the pasture or in the stable, if the mare and foal are brought in daily. It is a good plan, during the hottest months when the flies are bad, to bring mares and foals into the stable about 8 or 9 o'clock in the morning and leave them there until about 4 o'clock in the afternoon. During this time grain and hay should be fed. This may not be practicable for many farmers and ranchers, but is mentioned as one of the details which is desirable especially in fly season. If the mare is fed grain, it will be found that when the foal is 2 to 4 weeks old, he will begin to eat some of the grain with the mare. This is good for the foal as it provides nourishment for growth in addition to that obtained from his mother's milk. After the foal begins to eat grain he should be fed in a separate box in the stall with the mare tied up; if mares and foals are fed in pasture, creeps should be used.

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g. If the rule of weaning between the fifth and sixth months is followed, weaning will usually occur during the months of November and December. In Southern and Southwestern States weaning may occur earlier due to earlier foaling. In any case the growing season has passed before weaning, and there is little green grazing.

h. It is important, when the nourishment from the mare's milk is taken from the foal at weaning, that the foal be supplied with nourishment by other means so that his growth will continue satisfactorily. He should therefore have plenty of hay, and in addition, should be fed a mixture of grain. This grain feeding should begin with not less than two feedings of approximately 2 pounds each per day, and should be gradually increased until the foal is getting from 6 to 8 pounds of grain mixture per day.

26. Weaning.—*a.* At time of weaning the foal should be halter-broken and gentle enough so that he will give no serious trouble. In fact, from the day of foaling the foal should never be afraid of people. It is not necessary to make him a pet but rather treat him with calm unconcern and firmness that takes for granted that the foal will do exactly what is expected of him.

b. The exact date of weaning must be determined by balancing the condition of the foal against the condition of the mare. If it is evident that the foal is too much of a drain on the mare, it may be advisable to wean even before he is 5 months old.

c. If it becomes necessary to do this, special care and feeding will be required. A bountiful supply of cow's milk in addition to grain and hay will be found satisfactory. With a little care foals can be weaned early without serious trouble.

d. The manner in which weaning is actually accomplished depends largely upon the facilities available. A breeder who invests sufficient money, time and effort to produce good suckling foals owes it to himself and his investment to provide facilities for weaning properly. The ideal arrangements for weaning require box stalls in which the foals can be placed when first separated from the mares. Since foals are usually weaned in two groups—the first made up of the earlier foals and the other the later ones—and as 2 foals may be placed in each stall, if of fair size, 5 box stalls are adequate for weaning 20 foals. However, if box stalls are not available, a stable or shed may be used to house the foals during actual weaning. A small corral which has a tight fence made of lumber, rails placed close together, or woven wire with a plank or rail along the top will answer if stable or shed is not available. The fence should be at

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least 5 feet high and absolutely free of nails, projections, loose wires, or anything on which the foal can injure himself.

e. Assuming that box stalls, a separate stable, or shed are used for weaning, the mares and foals should be led in together and after the foals have been placed inside, the mares should be moved to a distant pasture or other quarters far enough away so that their foals cannot hear them neigh. The stalls or weaning stable should be well-bedded and good alfalfa or other hay and fresh water should be available. If the foals are placed in a small corral for weaning it is advisable to place an old dry mare or a quiet gelding in the corral with the foals to steady them, if one of suitable disposition is available. During the first day it is essential that the caretaker enter the stalls, stable, or corral at frequent intervals and hand feed the foals, giving them some grain or alfalfa. At this time one should realize that the foal has been taken suddenly from his mother, his source of food, his natural protection, and his constant companion since birth. The foal, resenting such separation, seeks something to take his mother's place, and this is the ideal time for the caretaker, through frequent visits, hand feeding, and gentle treatment, to gain his confidence. Foals should be kept in the confined quarters used for weaning for 2, 3, or 4 days, preferably the latter. During this time they should be fed from 1 to 4 pounds of grain daily in two or preferably three feedings, the quantity of grain depending on whether they have been fed grain while running with the mares. Also, they should receive about 3 pounds of alfalfa and as much good prairie, timothy, or mixed hay as they will eat. Some ranchers have found that their weanlings do well on straight alfalfa hay when accustomed to it.

f. About the fourth day the foals should be turned into a small pasture, preferably for about an hour. Since it is always advisable to have a bell mare run with a group of weanlings in pasture, it is best when weanlings are released for the first time to lead the bell mare into the pasture and let the weanlings follow. The natural tendency of weanlings when first placed in a pasture is to bolt and run wild, often resulting in severe injury. The presence of a quiet old mare being led slowly into the pasture gives the weanlings something to rally around and usually minimizes their tendency to run. For the first few days the periods in the pasture should be short, and not greater than half a day. As soon as it appears they are familiar with the pasture, its fences and watering places, and are properly settled, they may be permitted to run in the pasture all day or be left there if provision is made for feeding grain.

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g. The feeding of grain to weanlings should begin where the feeding of grain is left off at the time of weaning. If the foals were not fed grain while running with their dams, they should be started on grain very slowly at first, about 1 pound of grain mixture per day, this being gradually increased so that in 2 weeks the weanlings are consuming about 4 pounds of grain per day in two feedings. At all times they should be given all the hay they will eat.

h. After the weanlings have begun to consume satisfactorily 6 pounds of grain per day in two feedings, the grain should be gradually increased through the winter so that about the middle of February they are consuming 10 pounds. If this amount of feed is impracticable, very satisfactory developments can be had, and no

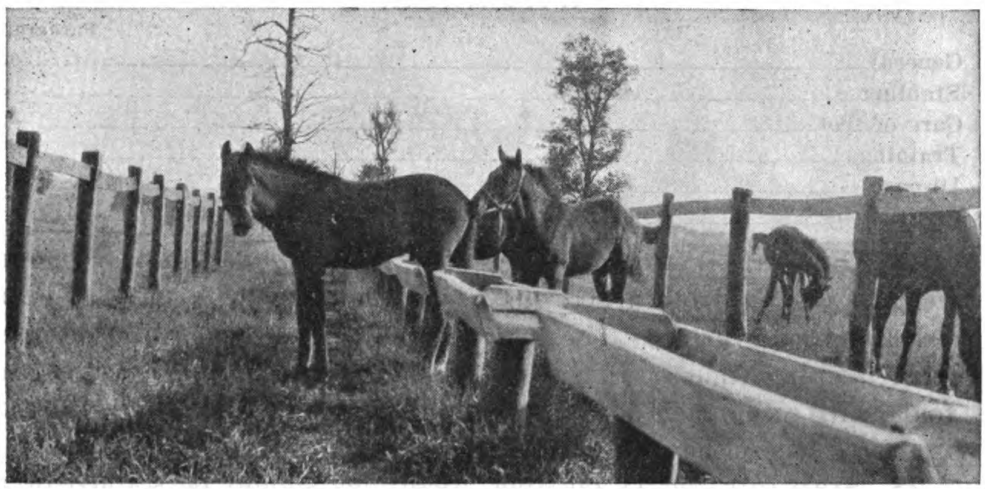

FIGURE 18.—Sucklings in a creep. (An excellent method of feeding grain to sucklings in pasture. Mares cannot enter creep.)

permanent stunting will result, if no more than 6 pounds of grain per day is fed. Some ranchers will find it impracticable and unprofitable to feed even to this extent. However, it should be remembered that a foal gets about half his growth the first year and it is therefore an economy in the long run to provide sufficient food to insure proper growth and development at that time. A foal stunted in his first year by insufficient feeding cannot be properly grown out by subsequent feeding. If economy in feeding must be exercised, it is best to wait until the foal is 2 years old, by which time he will have most of his growth.

i. As for all other classes of young horses, weanlings should be supplied with a bountiful amount of bonemeal and granulated salt mixture, one-third bonemeal and two-thirds salt.

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j. Mares should be watched closely for 3 or 4 days at weaning to see that they dry up without complications. Mares should be hand milked twice a day for the first 2 days, leaving a part of the milk in the bag at each milking. About the third day the mare should be milked once, and if everything is all right, she will not require milking the fourth day. If the bag shows signs of having too much milk, she should be milked daily until it is evident that she will dry up without any trouble. During the drying up period, her bag should be rubbed and anointed with camphorated oil.

SECTION V

WEANLINGS

	Paragraph
General	27
Stabling	28
Care of feet	29
Training	30
Disease	31
Castration	32

27. General.—After the foals have been weaned and are doing well, they should be turned out where they can get plenty of exercise and good grazing. They should not, even if a month has elapsed from weaning time, be turned in again with their dams. Mares and foals will recognize each other and will not do as well as if left separated where they will entirely forget each other.

28. Stabling.—*a.* If possible, weanlings should be stabled or at least be provided with a shed for shelter during the winter. This is very desirable in Northern States where it is cold and is advisable anywhere. In addition to providing shelter and protection from the elements, the stabling of weanlings and early yearlings has the added advantage of reducing injuries, and enables the breeder to handle his young foals, to gentle them, and to inspect them more closely for injuries and disease. Furthermore, it permits individual feeding and development, and, if time and labor are available, permits occasional, if not daily, grooming which, though not vitally necessary to development and growth, is unquestionably one of the best methods of gradually and permanently gentling a foal. Where it is not practical to stable weanlings, their pasture should be one providing plenty of natural shelter such as thick bushes and trees along stream beds.

b. It is realized that many ranchers will find it impracticable to provide stable room for their weanlings. Breeders must realize, how-

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ever, that their weanlings will not develop and grow out satisfactorily unless they are well-fed during the winter.

29. Care of feet.—*a.* The feet of weanlings should be rasped or trimmed regularly. This should be done at least once every 2 months. Few foals are born with absolutely straight legs, and still fewer grow up with straight legs and have square gaits unless their feet have regular attention. It is absolutely essential that the normal foot levels, natural uniform pressure on bearing surfaces of joints, and the natural uniform strain on ligaments and tendons be maintained at all times. This is assured by the frequent leveling of the feet and removal of horny wings (quarters) of the hoofs of growing

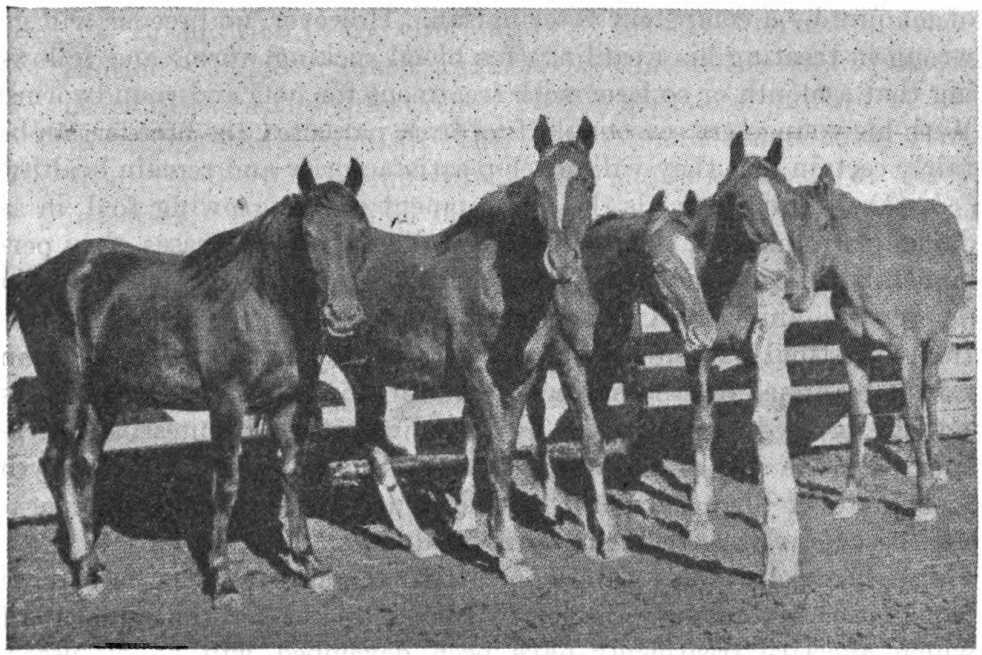

FIGURE 19.—Western mare. (With two daughters and two granddaughters. Notice improvement in quality.)

foals with the rasp. Corrections other than bringing the foot to normal are dangerous unless accomplished by experts. Even such corrections should be made gradually. The main point is that these corrections are important and should be made if the foal is to mature with straight legs and square gaits.

b. Regular trimming of the feet insures that the feet will not be thrown out of balance by irregular wear, that the hoof wall will not break up, that the colt will not become footsore and lame from badly broken or badly balanced feet, and, finally, that when the foal is grown, his market value will not be cut down due to bad feet or faulty gaits resulting from bad feet. Also regular trimming of the

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feet is a fine gentling exercise and makes the foal easy to shoe when time for shoeing arrives.

30. Training.—Little training need be given weanling foals other than gentling exercises such as hand feeding, grooming, handling of the feet, etc. However, if they have not been halter-broken as sucklings, this training should be given immediately after weaning.

31. Disease.—*a.* Weanlings are very susceptible to disease, parasitic infestation, etc., and it is very essential that everything possible be done to protect their health in this respect. It is advisable to treat the weanlings for worms after the first heavy frost. The quantity and type of worms present in weanling foals varies a great deal and only can be accurately determined by microscopic examination of manure by a competent veterinarian. However, no breeder will go wrong in treating his weanlings for blood sucking worms and following that a month or so later with treatment for bots and roundworms. With his youngsters reasonably free from parasites, the breeder can be fairly certain that they will develop satisfactorily and remain healthy.

b. (1) Nothing retards the development of the growing foal, in as damaging a manner, as intestinal parasites. In many cases, they permanently affect the constitution of the horse and often actually destroy the animal. A growing animal that is kept reasonably free from intestinal parasites will grow and develop much faster than an infested animal on the same amount of food. Hence, tremendous savings in feed can be made by the elimination of intestinal parasites. As the size of the mature horse is determined by his growth from date of birth to maturity, the elimination of intestinal parasites becomes a vital factor in horse production.

(2) There are many kinds of intestinal parasites, but only those which it is a common practice to treat for and for the removal of which effective treatments have been developed will be discussed. Parasitic diseases, unlike those caused by bacteria, are seldom spectacular in their onset. The symptoms are marked by a slowly progressive chain of changes which the owner may entirely overlook or confuse with other conditions. The general symptoms of worm infestation in the horse are weakness, emaciation, tucked up flanks, distended abdomen, rough coat, paleness of the membranes of the eye and mouth, and in some cases frequent colics and diarrhea. The animal usually eats well and shows no rise in temperature. Heavily parasitized animals tire easily. Parasites are particularly damaging to growing animals. They attack the foal when he should be making his best growth and produce stunting and lack of development.

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(3) The common intestinal parasites found in the horse are bots, roundworms, and strongyles (blood suckers of the large intestine). The latter worms, which are the smallest and seldom seen by horsemen, are by far the most destructive. Microscopical examination of the feces is the only method of determining their presence. Effective measures of control include sanitation and the proper treatment of the individual. Only drugs known to be effective for certain worms should be used. Powders fed in the feed of the animal are not effective. Most of the effective drugs must be accompanied by a purgative and given through a stomach tube. Do not try to pass a stomach tube unless you are thoroughly experienced; better consult your local veterinarian.

c. In addition to the elimination of intestinal parasites, every precaution should be taken against the contracting and spreading of other diseases and infections. This is best accomplished by keeping weanlings away from all other animals and immediately removing from the herd any individual that shows evidence of disease or infection. Feeding time is the ideal time to detect the presence of disease or sickness because a sick foal seldom cleans up his feed.

32. Castration.—Colts should be castrated before they show any signs of becoming "studdish." If this is not done, colts and fillies should be separated and placed in different pastures when about 9 months old; otherwise, many injuries will result. It is best to castrate in the fall or early spring when there are no flies. Every precaution against infection should be taken.

Section VI

YEARLINGS

	Paragraph
General	33
Feeding	34
Training	35
Stabling and ranging	36

33. General.—The importance of giving the young horse every advantage possible up to the spring of his 2-year-old year, in order to assure satisfactory development, cannot be overemphasized.

34. Feeding.—*a.* Yearlings can be turned out to pasture when grass is green, abundant, and nutritious without any other feeding and they will do very well until the grass begins to dry up in late summer or early fall. However, if practicable, it is advisable to continue a small feeding of grain during this time. When the grass begins to dry up yearlings should, if possible, graze part of the time on growing

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alfalfa or be fed good alfalfa hay. This should continue until cold weather sets in, when they should again be fed grain, in addition to hay and available grazing.

b. When the weather begins to get cold, the feed of grain to the yearlings should be commenced. This should be started with a feed of about 3 pounds a day in one feeding and gradually increased to 8 or 10 pounds per day in two or three feedings. This should continue

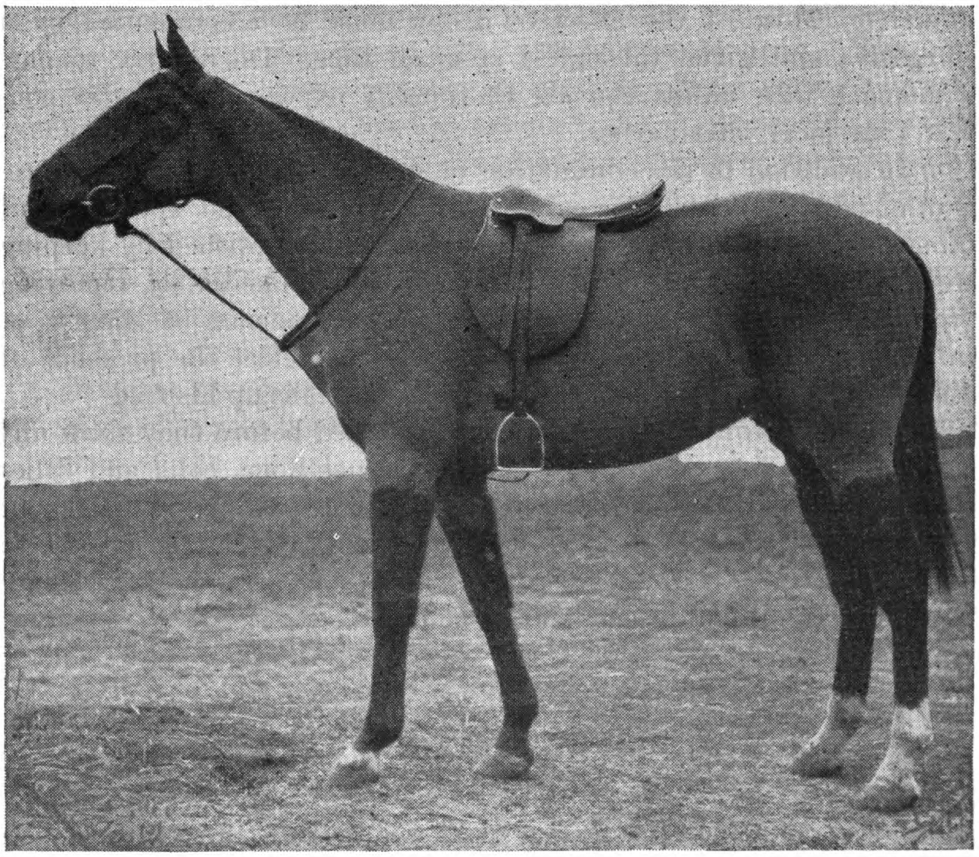

FIGURE 20.—The type thoroughbred desired for a trooper's mount.
(This horse was raised in Wyoming.)

throughout the winter. Yearlings should also have all the hay they will eat, the amount necessary depending on pasture conditions.

35. Training.—From birth every attempt should be made to gentle the foal and give him confidence. If the foal has not been halter-broken and gentled before his yearling summer, this should be done without further delay. Slack times on the farm or ranch should be used to get the yearlings in and thoroughly gentle them so they will lead, permit the handling of their feet, and, if time allows, they should be saddled. After yearlings are well-gentled, most of them will allow

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a man to be lifted gently on to their backs and be led around without trouble. When horses have reached this stage of training, there will be very little trouble in breaking them to ride.

36. Stabling and ranging.—Seek the happy medium between stabling and ranging. There are benefits to be derived from each, and losses if either is carried to an extreme. Do not permit any of your horses to live in filthy stalls or barnyards. This condition will cause diseased frogs and a large, clean, well-developed frog is essential to the circulation in the foot.

SECTION VII

TWO-YEAR-OLDS, THREE-YEAR-OLDS, AND FOUR-YEAR-OLDS

	Paragraph
Two-year-olds	37
Three-year-olds	38
Four-year-olds	39

37. Two-year-olds.—*a.* Two-year-olds which have been fed and cared for as previously described will develop satisfactorily to maturity without as much care and attention during their third and fourth years, provided they run in good pastures with plenty of water. It will, of course, be better if they can be fed some grain. However, it is so much more important to feed during the first 2 years, that if a saving in feed must be made, it should be made in the third and fourth years.

b. Before placing 2-year-olds in pasture for the summer, the breeder should see that their feet are properly trimmed and in good condition, that no injuries are present which require attention, and if possible, carefully record the weight and measurements of each animal. By weighing and measuring them again when taken up in the fall, the breeder can determine the progress and growth made while pastured. This will enable him, in succeeding years, to decide intelligently whether it is desirable to feed a small amount of grain during the summer months.

c. Ordinarily, ranchmen will not find it practicable or economical to grain their 2-year-olds in spring and summer. During this time 2-year-olds will do well in pasture with good water and salt; however, if practicable, it is better to give them some grain and hay, depending upon the condition of the pasture.

d. Very little training should be attempted with the 2-year-olds during the growing season when grass is fresh and green, as they should be given every opportunity to get all the green grass available for the longest possible period. Therefore, during this time, the

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2-year-olds should be allowed to run free in pasture, with or without supplementary feed.

e. Two-year-olds should be left in pasture where they can winter, if necessary, upon good pasturage with plenty of water. It is, however, better if, in addition to their winter pasturage, they can also be given some hay and grain. The grain feed need not be more than 3 or 4 pounds once a day.

38. Three-year-olds.—*a.* Three-year-olds should run on pasture during the growing season of the spring of their third year. Feeding hay and grain at this time is not necessary, provided the pasture

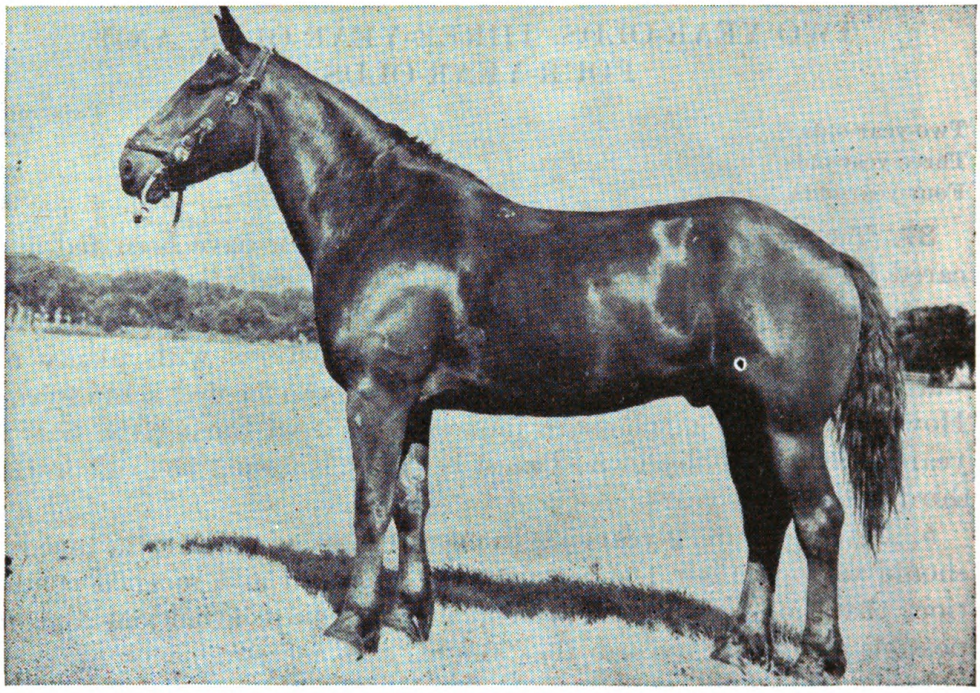

FIGURE 21.—Farm chunk. (A type of horse not desired by the Army for use of either Cavalry or Field Artillery.)

provides abundant, nutritious grazing. The benefit 3-year-olds receive from running on green pastures should not be lost by taking them up for training, unless special conditions warrant.

b. Three-year-olds should be left out until midsummer or early fall when they should be brought in, regentled, saddled, and ridden for a short time each day. As soon as they are going quietly under the saddle they can be used for moderate work on the farm or ranch, but should not be ridden hard. During this time they should be ridden with a hackamore, or a hackamore with a snaffle bit suspended in the mouth. This bit should be drawn up snugly in the corners of the mouth so that they will not be tempted to get their tongues over it.

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c. After they are going well in this kind of a bridle, reins should be attached to the snaffle bit and used as well as the reins on the hackamore. Every effort should be made at this period to keep them calm, confident, and willing. Particular attention should be given to preventing them from becoming afraid of having their mouths hurt.

d. Unless the breeder can have his young horses worked by a thoroughly competent rider, who really knows how to train and handle them, it is far better to limit their work under the saddle to exercise only. Improper training is worse than no training at all as a horse whose disposition or mouth has been ruined is of little value.

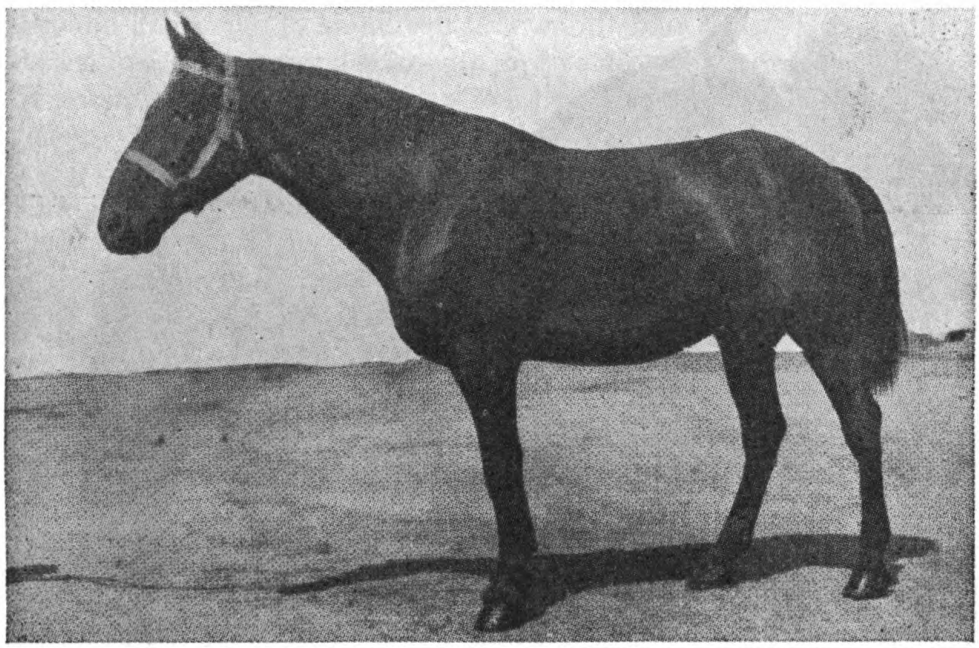

FIGURE 22.—Field artillery type. (Height 15.1 hands, weight 1,225 pounds, girth 74 inches, cannon 8½ inches. An ideal type. Active and heavy enough for all purposes.)

e. If it is not practicable to use and ride them during the fall and winter of their 3-year-old year, they should be turned into a good pasture, either with or without grain, but preferably with grain.

39. Four-year-olds.—*a.* In the spring of their fourth year, horses should be ready to do ordinary farm or ranch work, care being taken not to overwork them. Four-year-olds are not entirely developed and their legs will not stand as much work as those of a mature horse. As to their feeding, they can be treated practically as mature horses. If being used, they should be fed grain and hay. When not in use, they can be turned on pasture.

b. As most horses are sold during their fourth year, a few points on conditioning horses for sale and presenting horses to buyers should be

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considered. Many breeders who produce and raise fine horses do not secure good prices through failure to present their horses properly when showing them to a buyer. Faulty conformation, lack of quality or size, and unsoundness cannot be covered up. If the buyer is a competent one he will not overlook these details. However, without practicing any deception, the breeder can do much to influence the buyer's impression of the horse's general appearance and disposition.

(1) First of all, the horse should be gentle whether shown on the halter or under the saddle, or both. Few buyers will waste time

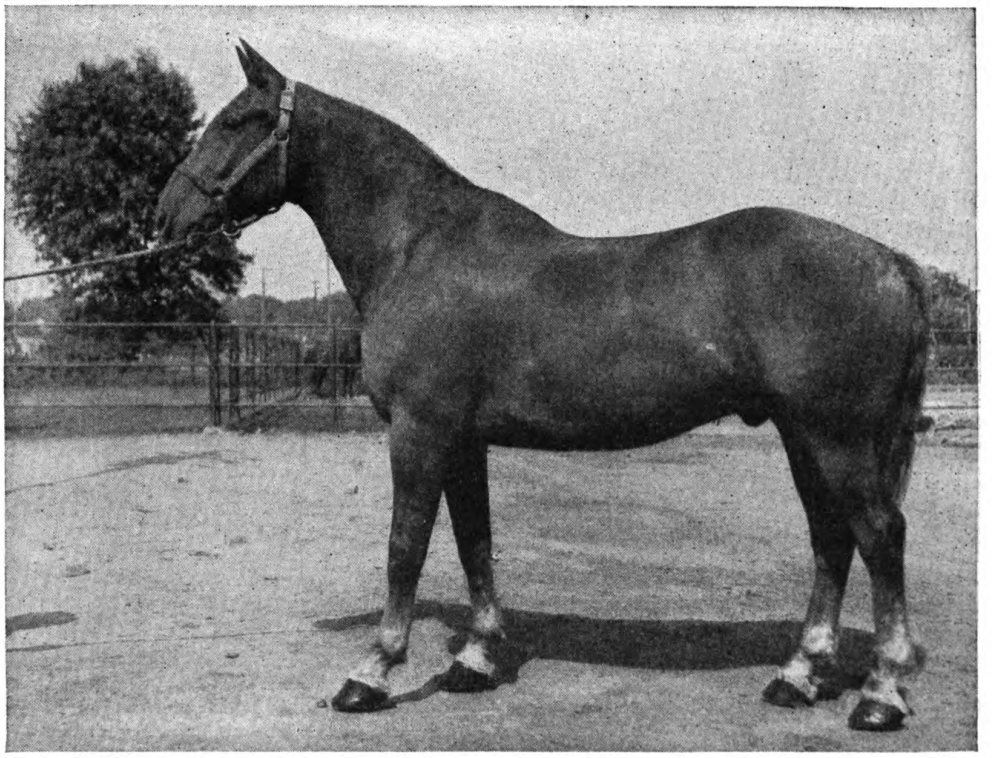

FIGURE 23.—Field artillery type. (Height 15.3 hands, weight 1,300 pounds, girth 83 inches, cannon 9¾ inches. Excellent heavy type, maximum size desired for modern field artillery.)

looking at a nervous, high-strung, snorty animal which cannot be approached or handled with safety. To determine a horse's soundness it is often necessary to pick up his feet, feel of his hocks, or otherwise handle him. If this cannot be done with reasonable ease and safety the horse will likely be rejected. A well-broken horse that will go quietly under the saddle is more salable than an unbroken one. Therefore, it is well to have the horse broken and capable of being ridden at the walk, trot, and gallop on straight lines. But, whether broken or unbroken, the horse should be gentle.

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(2) Secondly, the horse should present a good appearance so far as flesh, cleanliness, and grooming are concerned. It may not always be possible to have a horse in good flesh, but the breeder will find that feed expended toward that end will pay big dividends. The horse should be trimmed neatly. This may be accomplished by roaching the mane or by evening the mane by plucking. It is usually best to roach half-breds and leave manes on thoroughbreds. Fetlocks should be trimmed and long hair in ears cut off even with the edge of the ear. Feet should be trimmed and the horse should be well groomed.

(3) When led out to be shown the horse should be placed on level ground and made to stand squarely on all four feet. He should not be excited as so many dealers attempt to do. The horse should have, if possible, an attitude of attention, but also of confidence and relaxation. When directed by the purchaser, the horse should be shown at a walk, trot, and gallop on the halter or, if broken, under the saddle.

(4) The breeder should be prepared to give the horse's breeding, and, if the animal is registered, to show his registration certificate. Many persons who present horses for sale are not interested in breeding, and make no effort to learn the breeding of the horses they are showing. However, they should remember that the buyer is vitally interested in this detail, and a registration certificate often makes a sale. Every good foal entitled to registration should be registered as it makes any horse more attractive to a prospective purchaser.

SECTION VIII

METHOD OF MEASURING

Paragraph
Method of measuring 40

40. Method of measuring.—The normal measurements pertinent to a horse are his height, weight, girth, and bone. The height is the vertical distance from the ground to the highest point of the withers and is expressed in hands and inches, a hand being 4 inches. The weight is of course obtained by placing the animal on a properly balanced scale and is recorded in pounds. The girth measurement is the circumference of the body in inches measured at the juncture of the withers and back. Size in girth is desirable as it indicates heart and lung space. The bone is measured by encircling the cannon bone halfway between the knee and fetlock with a tape and recording the measurement in inches.

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APPENDIX I

RULES GOVERNING REGISTRATION IN THE HALF-BRED STUD BOOK

1. **Foals.**—The following classes of foals are eligible for registration in the Half-Bred Stud Book:

a. Foals by registered thoroughbred or registered Arabian stallions out of mares that are not registered in the American Stud Book.

b. Foals by registered, purebred stallions of breeds other than thoroughbred, or Arabian registered in the American Stud Book, out of registered thoroughbred mares, or Arabian mares registered in the American Stud Book.

2. **Brood mares.**—Half-bred brood mares, not over 12 years old, eligible for registration under paragraph 1, may be registered at foal rate ($2), but only when the application for the registration of the mare is accompanied by an application for the registration of her current year's foal, or by application for the registration of one or more of her previous years' filly foals.

3. **First time registration.**—Breeders registering for the first time may register foals of and since the year 1930 at foal rate, but only at the time applications are submitted for the registration of current year's foals. The breeder within the meaning of this proviso is the bona fide owner of the dam of the foal sought to be registered at the time of foaling of said foal.

4. **Certificates.**—Registration certificates for foals are issued upon receipt, prior to December 31 of the year of foaling, of a properly executed application, accompanied by the registration fee.

5. **Registration.**—*a. Fees.*

Foals	$2
Yearlings	4
Half-bred horses of all other ages, excepting brood mares falling under the provisions of paragraph 2, and horses falling under the provisions of paragraph 3	10

NOTE.—Requests for blank applications for registration should be made to the proper remount area headquarters. (Address and the territory embraced by each area is shown in app. II.)

b. Applications.—Applications for registration, when executed and accompanied by the amount of registration fee, should be forwarded to the proper remount area headquarters, which, after recording, will transmit them to the Registrar, the Half-Bred Stud Book for issuance of registration certificates. Officers in charge of remount areas will be glad to assist breeders in the preparation of their applications.

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Appendix II

REMOUNT DEPOTS AND REMOUNT AREAS

1. Remount depots.

Front Royal, Va.
Fort Reno, Okla.
Fort Robinson, Nebr.

2. Remount areas.

Eastern Remount Area.—Includes the States of Connecticut, Delaware, Maine, Maryland, Massachusetts, New Hampshire, New Jersey, New York, Pennsylvania, Rhode Island, Vermont, Virginia, and the island of Puerto Rico; headquarters, Front Royal Remount Depot, Front Royal, Va.

East Central Remount Area.—Includes the States of Alabama, Florida, Georgia, Illinois, Indiana, Kentucky, Louisiana, Michigan, Mississippi, North Carolina, Ohio, South Carolina, Tennessee, West Virginia, and Wisconsin; headquarters, 434 Post Office Building. Lexington, Ky.

North Central Remount Area.—Includes the States of Arkansas, Iowa, Kansas, Minnesota, Missouri, Nebraska, North Dakota, and South Dakota; headquarters, Room 502, Central Post Office Building, 315 West Pershing Road, Kansas City, Mo.

South Central Remount Area.—Includes the States of Oklahoma and Texas; headquarters, San Angelo, Tex.

Northwestern Remount Area.—Includes the States of Idaho, Montana, Utah, and Wyoming; headquarters, Salt Lake City, Utah.

Southwestern Remount Area.—Includes the States of Arizona, Colorado, and New Mexico; headquarters, Colorado Springs, Colo.

Western Remount Area.—Includes the States of California, Nevada, Oregon, Washington, and the Territory of Hawaii; headquarters, San Mateo, Calif.

Note.—Inquiries concerning stallions at stud under the Army breeding plan should be addressed to the officer in charge of the remount area concerned.

[A. G. 062.11 (12-21-40).]

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QUARTERMASTER CORPS

BY ORDER OF THE SECRETARY OF WAR:

G. C. MARSHALL,
Chief of Staff.

OFFICIAL:

E. S. ADAMS,
Major General,
The Adjutant General.

DISTRIBUTION:

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